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**Proposed Revision to the Federal Underground  
Injection Control Requirements for Class I  
Municipal Wells in Florida**

**Economic Analysis**

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# 1. Introduction

## 1.1 What is the Purpose of the Analysis?

This document estimates the economic impact of regulations that the Environmental Protection Agency (EPA) plans to propose to address certain Class I underground injection control (UIC) wells in Florida. The proposal recognizes the unique geologic conditions in Florida and offers compliance options to Class I wells that inject domestic wastewater. Under these compliance options, facilities that exhibit fluid movement will incur additional costs to protect the Underground Source of Drinking Water (USDW)—we will estimate these additional costs.

In the absence of regulatory changes, facilities that exhibit fluid movement would probably be forced to close their wells and adopt alternative disposal practices. This analysis also estimates the cost that facilities would incur under this no-regulation “baseline” scenario and shows that the costs associated with closing the wells and adopting alternative disposal practices are higher than the costs resulting from the regulatory changes that EPA is considering.<sup>1</sup>

The analysis provides a simple, straightforward understanding of the relative impacts of the approaches. Our goal is to base cost estimates by determining the cost that the “average” facility will incur. In reality, some facilities may incur costs that are higher or lower than the average costs predicted by this analysis.

## 1.2 How are Class I Wells Regulated Under the Safe Drinking Water Act?

Part C of the Safe Drinking Water Act (SDWA, 42 U.S.C. §300h *et seq.*) provides the statutory authority for the proposed rule. The SDWA establishes criteria for the UIC program. The program defines 5 classes of injection wells, based on their construction and injectate quality. Class I wells inject hazardous, industrial, or municipal wastes and are defined as “wells which inject fluids beneath the lowermost formation containing, within one quarter mile of the well bore, an underground source of drinking water.” These wells are the deepest and usually the most technically complex injection wells.

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<sup>1</sup>Because costs associated with the proposed rule are lower than the costs associated with maintaining the current regulation, EPA’s proposed rule does not meet the definition of a “major” rule.

According to the SDWA and its legislative history, the chief intent of the UIC program is to protect USDWs, which include aquifers that are currently used as a source of drinking water, as well as aquifers with adequate quality and yield for use in the future. USDWs contain waters with less than 10,000 mg/l of total dissolved solids.

### **1.3 What is the History of the Use of Class I Wells in Florida?**

Under the SDWA, States may apply to EPA for primary responsibility to administer the UIC program. States that receive this authority are referred to as “Primacy States.”<sup>2</sup> Florida received primary responsibility for the UIC program for Class I, III, IV, and V wells on March 9, 1983.

Florida is characterized by a unique environment as well as unique stresses upon its resources. In the face of a rapidly growing population, Florida’s water resources are increasingly fragile and valuable. Population growth has increased the demand for drinking water and expanded the need to protect water resources from contamination by domestic wastewater. The quantities of wastewater generated by many communities make surface disposal problematic—regardless of treatment, the influx of low-saline wastewater into saline or brackish coastal waters can disrupt established ecosystems. In other areas, surface disposal in periods of heavy rainfall enhance flooding of natural systems.

More than 20 years ago, Florida began using underground injection of domestic wastewater as an alternative disposal method. At the time, it was assumed that injected fluids were not able to migrate upwards into more shallow geologic formations. In the past several years, however, increased experience with and monitoring of injection operations has revealed that the geologic zones that had been characterized as “confining” are not truly impermeable. Because of the volumes and pressures at which injection has occurred, groundwater monitoring has shown migration of injected fluids into the lowermost USDW at a limited number of locations.

### **1.4 What Options Is EPA Considering for Addressing Fluid Movement Associated with Class I UIC Wells in Florida?**

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<sup>2</sup> Primary enforcement responsibility (primacy) is vested in States that have UIC programs approved by EPA’s Administrator. “Direct Implementation” (DI) refers to programs in states that are administered directly by EPA regional offices. Currently, 35 States have full primacy and 17 States are directly implemented by EPA regional offices. Five States have a combination of state oversight and direct implementation commonly referred to as “partial primacy.”

EPA has considered several approaches for addressing Class I municipal wells in Florida. On July 7, 1999, the Agency discussed these options with stakeholders at a public meeting in West Palm Beach, Florida. The options that were discussed included requiring more stringent treatment for injected wastewater; promoting wastewater reuse; reclassifying the municipal injection wells to Class V wells; allowing some of the wastewater injection wells to obtain “aquifer exemptions”;<sup>3</sup> and maintaining the current regulatory approach. Based on stakeholder input and analysis of the issue, EPA is co-proposing two alternatives that would allow continued use of Class I wells, while ensuring that injected wastewater is treated sufficiently to protect the USDW. The Agency will also work with the State to promote wastewater reuse.

This economic analysis estimates the cost associated with maintaining the current regulatory approach and two proposed alternatives that would allow continued use of Class I wells. Specifically, the approaches for which costs are estimated include the following:

- **Baseline Scenario (No Regulatory Action).** If EPA did not make any regulatory changes, Class I wells that exhibit fluid movement would be required to close, and alternative wastewater disposal approaches would be required.
- **Option 1: Advanced Treatment.** EPA is co-proposing an approach that would require some level of advanced treatment (i.e., treatment that is more advanced than secondary treatment, which is currently required by Florida). Treatment would be required to ensure that fluid that migrates to the USDW does not endanger the USDW. Facilities would be required to show that, as a result of the more advanced treatment, fluid that reaches the USDW meets National Primary Drinking Water Standards (NPDWSs). This regulatory option would enable the Florida facilities to continue to use Class I municipal wells for waste disposal, while ensuring the protection of USDWs.
- **Option 2: Demonstration and/or Treatment Upgrade.** EPA is also co-proposing an approach that would require facilities with fluid

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<sup>3</sup>Under the current UIC regulations, injection wells that meet the criteria in 40 CFR 144.7(b) can apply for and obtain aquifer exemptions, which, among other things, would allow injection to continue even if fluid movement occurs. This option would continue to be available to Florida Class I wells—the proposed regulation would not affect provisions relating to aquifer exemptions. However, EPA is not aware of any Class I facilities in Florida that meet the criteria for an aquifer exemption.

movement to either provide more stringent treatment (e.g., some level of advanced treatment) to prevent endangerment, or to demonstrate through modeling and monitoring that, even without more advanced treatment, the injectate meets drinking water standards when it reaches the base of the USDW. As with Option 1, this approach would enable the Florida facilities to continue to use Class I municipal wells as an alternative for waste disposal, while ensuring the protection of USDWs.

To assess the net impact of the regulatory approaches that EPA is considering, we will compare the impact of the Baseline Scenario to regulatory Options 1 and 2. We show that both of these regulatory approaches reflect a cost savings when compared to the Baseline Scenario.

## **2. What Assumptions Are Reflected in the Economic Analysis?**

### **2.1 How Many Facilities Are Potentially Affected by the Rule?**

The proposed rule addresses Class I municipal wells only—Class I industrial and Class I hazardous wells are not affected. The rule covers only the geographic areas that are underlain by the relevant geology. The area in which criteria for injection authorization under the proposed rule are expected to exist is limited geographically to peninsular Florida from Pinellas County on Florida’s Gulf Coast to Brevard County on the Atlantic Coast and counties to the south. It is also limited geologically where the injection and confinement zones are both in the Floridian Aquifer, and where there is not an adequate clastic shale confining unit separating the injection zone from the lower most USDW.

Forty-two existing Class I facilities are located in the area affected by the rule. Appendix A identifies these facilities. Together, they currently operate 94 wells. Only those facilities that exhibit fluid movement would be required to take action under this regulation. For the economic analysis, we are developing a “high-end” estimate that assumes that all of them will need to take action because of fluid movement issues. We are also developing “low-end” estimates that assume that 25 percent will face fluid movement issues. EPA believes that the actual cost will be closer to the low-end estimate.

## 2.2 What Are the Current Minimum Regulatory Requirements for Florida Class I Facilities?

In order to estimate incremental impact, this analysis considers facilities' current requirements for hydrogeologic studies and their current treatment and monitoring practices. It then identifies the additional steps that the facilities must take to address fluid migration under the baseline scenario and under the other approaches that EPA is considering.

Under Florida's regulations, requirements that apply to Class I injection wells include the following:

- **Hydrogeologic Studies.** Facilities must “demonstrate that the hydrogeologic environment is suitable for waste injection without causing or allowing movement of fluid into a USDW, if such movement may cause a violation of a primary drinking water standard, or without modifying the ambient water quality of other aquifers overlying the injection zone” [62-528.405(1)(a) F.A.C.]. In addition, as part of their permit application, facilities must also “demonstrate that the confining zone(s) has sufficient areal extent, thickness, lithologic and hydraulic characteristics to prevent fluid migration into USDWs” [62-528.405(2)(a) F.A.C.].
- **Secondary Treatment.** Under Florida regulations, municipal Class I wells must “demonstrate that effluent quality meets secondary treatment requirements” [62-528.450(2)(f)(3) F.A.C.].
- **Monitoring.** Florida regulations also contain several monitoring provisions. Specifically, facilities must:
  - “Monitor for the absence of fluid movement adjacent to the well bore and the long-term effectiveness of the confining zone” [62-528.425(1)(g)(1) F.A.C.].
  - “Perform periodic monitoring of ground water quality in the lowermost USDW, as required by the Department” [62-528.425(g)(5)(c) F.A.C.].
  - “Perform additional monitoring to determine whether fluid movement caused by injection is occurring into or between USDWs, as required by the Department” [62-528.425(g)(5)(e) F.A.C.].
  - Current common practice of Class I municipal well operators in Florida with respect to underground injection is to: 1) sample the

wastestream monthly and analyze for 7 water quality parameters, 2) sample monitoring wells at both the upper and lower monitoring zones monthly and analyze for 10 water quality parameters, and 3) perform an annual complete primary and secondary drinking water analysis of the wastestream based on a 24 hour composite sample.

### **2.3 To What Extent Do Florida Class I Facilities Employ Treatment that Exceeds Florida's Minimum Requirements?**

For the purposes of the economic analysis, we are assuming that, at a minimum, Class I facilities meet minimum Florida standards. However, we also recognize that some facilities employ treatment or have the capacity to employ treatment that exceeds secondary standards. For example, many facilities currently provide or have adequate treatment capacity to provide high-level disinfection (defined by Florida as disinfection with a minimum chlorine residual of 1.0 mg/L after 15 minutes contact, along with a requirement that the effluent be essentially free of fecal coliform). Others provide or have adequate capacity to provide water purification that would result in lower BOD levels. Based on a preliminary review of information provided during the July 7, 1999, Class I Public Meeting and of data from the Clean Water Needs Survey, EPA assumes that facilities that represent more than 20 percent of injected wastewater have adequate treatment in place to meet the treatment requirements of EPA's regulatory options.

### **2.4 What Would Facilities Have to Do if EPA Did Not Change the Regulations (e.g., under the Baseline Scenario)?**

#### ***2.4.1 What Disposal Options Are Available to Facilities that Must Cease their Discharge?***

We are assuming that, in the absence of a rulemaking, facilities that exhibit fluid movement would be forced to cease their injection and find alternative disposal. We are assuming for the high-end estimate that all 42 facilities would have to cease their injection; for the low-end estimate we are assuming that 25 percent would have to cease their injection.

Disposal alternatives would need to be evaluated on a case-by-case basis, but most facilities would probably increase reuse efforts and/or dispose of their effluent via surface water discharge. It is possible that some facilities could use Class V wells or obtain aquifer exemptions. However, EPA is not aware of any facilities that would be able to take advantage of these opportunities, so we are not considering them as part of the economic analysis.



### Reuse

Many Florida municipalities take advantage of reclaimed water systems for a portion of their wastewater. In other words, they dispose of treated wastewater by using it for irrigation of lawns, golf courses, agricultural lands, etc. The Florida Legislature promotes reuse as a formal State objective (373.250 and 403.064, Florida Statutes). In response to these objectives, the Florida Department of Environmental Protection has implemented a comprehensive reuse program. Much of the program focuses on designated “water resource caution areas”—areas facing critical water supply problems (existing and projected to develop over the next 20 years). The State’s Water Policy (Chapter 62-40, Florida Administrative Code) requires implementation of water reuse within the designated water resource caution areas (see Figure 1). In addition, Section 403.064 of Florida Statutes places additional limitations on deep well injection projects and other forms of effluent disposal (surface discharges and ocean outfalls) within these areas, if reuse has been determined to be feasible. Further, Florida’s Antidegradation Policy essentially establishes a preference for reuse over new or expanded surface water discharges in Florida.

The response to Florida’s reuse program has been impressive. Over 450 wastewater treatment facilities provide reclaimed water for one or more beneficial uses. Reuse capacity now totals over 1.0 billion gallons per day (1999 Reuse Inventory)—about 45 percent of the State’s total permitted capacity of all domestic wastewater treatment facilities. Reuse has become an integral part of wastewater and water resource management in Florida and the state has come to be recognized as a national leader in water reuse.

Florida features comprehensive rules governing water reuse in Chapter 62-610, Florida Administrative Code. These rules address the use of reclaimed water for a wide range of landscape and agricultural irrigation and industrial activities. Ground water recharge and indirect potable reuse options also are included in Chapter 62-610.

As Stated above, EPA will continue to work with Florida to promote reuse. The Agency does not believe that its regulatory action addressing fluid movement will significantly impact trends toward increase reuse. Since no significant incremental impact resulting from reuse programs is associated with the proposal (or lack thereof), we are not considering their costs as part of this analysis.

### Surface water discharge

It is very difficult to permit new or expanded surface water discharges in Florida. First, the hydrology and water quality of surface waters in the

State generally dictate very stringent permit limits (advanced treatment requirements are common) or may completely preclude any discharge. Second, statutory requirements dictate that advanced treatment (5 mg/L CBOD5, 5 mg/L TSS, 3 mg/L total nitrogen, 1 mg/L total phosphorus) be provided for all discharges in the Tampa Bay and Indian River Lagoon areas.

Nevertheless, we are assuming that, in the absence of EPA's regulations, most facilities would be forced to employ surface water discharge.

#### **2.4.2 What Actions Must Facilities Take to Convert to a Surface Water Discharge?**

While we recognize that not all Florida facilities have the same disposal options available to them, we are basing our analysis of the Baseline Scenario on costs associated with converting to a surface water discharge. These costs will vary from site to site. We are adopting the following assumptions as an average representation about the actions that facilities would need to take:

- **Close existing wells.** Facilities would need to properly plug and abandon their Class I wells.
- **Upgrade treatment.** The analysis assumes that facilities that do not already have advanced treatment in place would upgrade to advanced treatment under this approach. Specifically, we are assuming that the majority of facilities would need to upgrade to an advanced treatment plant that meets limits of 10 mg/l for BOD, 10 mg/l for suspended solids, 3 mg/l for total nitrogen, and 1 mg/l for total phosphorus. In addition, these facilities would be required to upgrade treatment to include at least basic disinfection (chlorination) with dechlorination.

We are also assuming that facilities that would discharge into sensitive Florida Waters such as the Tampa Bay or the Indian River Lagoon System would have to meet more stringent standards (e.g., 5 mg/l for BOD), as well as strict water quality standards to comply with stringent antidegradation standards. Essentially, these facilities would have to treat water quality parameters to levels analogous to drinking water standards. For costing purposes, we are assuming that facilities discharging into sensitive water will require reverse osmosis (RO).

In reality, the specific type of treatment that facilities must provide will vary depending on influent quality, site-specific effluent limitations, and other factors, but we believe that these

treatment technologies are representative of the kinds of treatment that facilities would be required to employ.

- **Construct an outfall.** Incremental costs for conveyance will vary widely from municipality to municipality. For the purposes of this analysis, we are assuming that each facility would construct a 36-inch pipeline two miles in length.
- **Conduct additional monitoring.** Facilities that convert to surface water discharge would also be required to spend more on monitoring than they currently spend for their UIC injection.

## 2.5 What Activities Are Associated with Option 1 (Advanced Treatment)?

Option 1 requires Florida Class I dischargers that exhibit fluid movement to provide advanced treatment (i.e., treatment more stringent than secondary treatment). They would also be required to show that this level of treatment ensures that NPDWSs are met at the USDW, and they would be required to conduct more monitoring than they currently conduct. Specific requirements are as follows:

- **Upgrade to advanced treatment.** Facilities that do not already provide advanced treatment (i.e., treatment more stringent than secondary treatment) would be required to upgrade. EPA is seeking comment on the appropriate level of BOD removal and the necessity of nutrient removal technology. For costing purposes, we are providing estimates for four advanced treatment scenarios. Each estimate reflects a target level of contaminant removal and the upgrade necessary to achieve each:
  - 1) Treatment to 10-24 mg/l BOD
  - 2) Treatment to 10-24 mg/l BOD with nutrient removal
  - 3) Treatment to <10 mg/l BOD
  - 4) Treatment to <10 mg/l BOD with nutrient removal

We are also assuming that facilities will be required to provide high-level disinfection with dechlorination if they do not already employ it. We believe that these levels of treatment represent the range of advanced treatment that facilities will need to ensure that standards are met at the USDW.

- **Construct additional monitoring wells.** The number of additional monitoring wells will vary from facility to facility. For costing purposes, we are assuming that facilities would add one monitoring well for every discharge well.

- **Conduct more monitoring.** Again, the incremental increase in monitoring activities will vary depending on influent quality, geological characteristics, and other factors. We are assuming that the cost of Class I facilities' monitoring requirements would be analogous to costs incurred in monitoring to ensure compliance with drinking water standards.
- **Demonstrate that fluid migrating to USDWs meets drinking water standards.** Before selecting appropriate advanced treatment, facilities would be required to demonstrate that the treatment would ensure that fluid reaching the USDW meets drinking water standards. It is assumed that the demonstration requirements will be more extensive the lower the level of advanced treatment that is put in place.

## 2.6 What Activities are Associated with Option 2 (Demonstration and/or Treatment Upgrade)?

EPA is also proposing an option that would, in lieu of automatically requiring advanced treatment, allow facilities to demonstrate through modeling and monitoring that the injectate meets drinking water standards when it reaches the base of the USDW. As with the other approaches, municipalities' strategies for compliance would vary. For the economic analysis, we are assuming that facilities that exhibit fluid movement would take the following steps:

- **Conduct a demonstration study.** We are assuming that all facilities will attempt to demonstrate that the injectate meets drinking water standards at the base of the USDW. To conduct this study, we are assuming that facilities would be required to:
  - Perform hydrogeologic modeling.
  - Perform geochemical analysis.
  - Develop ground water monitoring plan.
  - Analyze ground water monitoring data.
  - Analyze fate of parameters likely to be present in the effluent.
  - If no high-level disinfection, demonstrate that pathogen removal will be equivalent or better than high-level disinfection at lowermost USDW.
  - Calculate travel time from point of injection to base of USDW.
  - Provide data on wastewater treatment plant reliability.

- Provide operational history of facility and wells.
- Demonstrate adequacy of pretreatment.

The demonstration envisioned under this approach is more labor-intensive than the "demonstration" required under Option 1. For example, Option 1's demonstration does not necessarily require an incremental increase in monitoring activities.

- **Upgrade treatment.** The economic analysis assumes that facilities that currently provide advanced treatment and high-level disinfection will succeed in making the demonstration described above. Other facilities will be able to make the demonstration if they add high-level disinfection with dechlorination to deactivate viruses. Still others will have to upgrade to advanced treatment. As in Option 1, four different levels of advanced treatment are being considered:

- 1) Treatment to 10-24 mg/l BOD
- 2) Treatment to 10-24 mg/l BOD with nutrient removal
- 3) Treatment to <10 mg/l BOD
- 4) Treatment to <10 mg/l BOD with nutrient removal

Of the facilities that do not currently provide advanced treatment and high-level disinfection, we are assuming in this draft that 25 percent will be able to make the demonstration with the addition of high-level disinfection only and 75 percent will have to provide both high-level disinfection and some level of advanced treatment. For facilities that already provide advanced treatment and high-level disinfection, we are assuming that no upgrades will be required.

- **Construct additional monitoring wells.** As in Option 1, this analysis assumes that number of additional monitoring wells will vary from facility to facility. We are assuming that facilities would add one monitoring well for every discharge well.
- **Conduct more monitoring.** We are using the same monitoring assumptions here as we are using in Option 1; i.e., that monitoring requirements would be analogous to costs incurred to ensure compliance with drinking water standards.

### 3. What are the Estimated Economic Impacts?

This section presents the estimated costs for each approach, based on the assumptions discussed in Section 2. Appendix B details how these equations were applied to the Class I municipal facilities in Florida

#### 3.1 What Costs Are Associated with the Baseline Scenario?

If EPA did not make any regulatory changes, Class I wells that exhibit fluid movement would be required to close, and alternative wastewater disposal approaches would be required. This is the “Baseline Scenario.” Costs associated with this scenario include upgrading treatment (with RO required at facilities that discharge into sensitive waters), closing the existing wells, and discharging the highly treated effluent. Exhibit 1 summarizes these costs. It shows that high-end estimates (assuming that all facilities will exhibit fluid movement) and the low-end estimates (assuming that only 25 percent of facilities will exhibit fluid movement).<sup>4</sup>

<b>Exhibit 1</b> <b>Summary of Baseline Costs</b> <b>(No Regulatory Change--Assume Surface Water Disposal)</b>				
Activity	Capital Costs	Annualized Costs		
		Annualized Capital Costs *	Incremental Annual O&M Costs	Total Annualized Costs
High End Estimates				
Upgrade to advanced treatment (some facilities)	1,173,592,034	110,778,786	388,998,786	499,777,572
Upgrade to basic disinfection and dechlorination (some facilities)	12,540,871	1,183,769	5,998,016	7,181,785
Upgrade to RO (some facilities)	790,200,924	74,589,377	141,526,851	216,116,229
Close Existing Wells	18,800,000	1,774,587	-	1,774,587
Build Outfall	887,040,000	83,730,301	-	83,730,301
Conduct Additional Monitoring	-	-	1,972,146	1,972,146
<b>Total (high end)</b>	<b>2,882,173,829</b>	<b>272,056,820</b>	<b>538,495,800</b>	<b>810,552,620</b>
<b>Total (low end)</b>	<b>720,543,457</b>	<b>68,014,205</b>	<b>134,623,950</b>	<b>202,638,155</b>
<b>Cost Per Facility</b>	<b>68,623,186</b>	<b>6,477,543</b>	<b>12,821,329</b>	<b>19,298,872</b>

\* Based on a 7% cost of capital and a 20-year period of analysis.

<sup>4</sup>Throughout this document, the low-end costs are calculated as 25 percent of the high-end costs. We do not attempt to make predictions about which facilities will exhibit fluid movement.

### 3.1.1 How Was the Cost of Treatment Upgrades Under the Baseline Scenario Derived?

Estimated capital cost for upgrading to advanced treatment is based on cost curves from the 1995 Clean Water Needs Survey (CWNS)<sup>5</sup>. For the Baseline Scenario, we used CWNS equations for new construction of an "advanced treatment II" plant (i.e., a plant that achieves less than 10 mg/L BOD) with nutrient removal. In the case of facilities upgrading from secondary to advanced treatment, the CWNS provides an equation to calculate the "salvage cost" of the secondary treatment plant, which is then subtracted from the new construction cost. For those systems upgrading to basic disinfection (chlorination) with dechlorination, the CWNS also provides equations to calculate the costs for chlorination. Dechlorination costs were calculated from an engineering cost curve derived for this economic analysis.

The incremental difference in O&M costs was calculated as the difference between O&M costs for advanced treatment and O&M costs for cost of secondary treatment.<sup>6</sup> This incremental difference was added to the O&M costs for basic disinfection with dechlorination. These O&M costs were estimated to be the same as those for an upgrade to high-level disinfection. A detailed description of the derivation of high-level disinfection O&M costs is given under the Option 2 economic analysis.

Based on discussions with EPA Region 4 and the State of Florida, we identified facilities that may be required to install RO. In general, these include facilities that discharge to the Tampa Bay and to the Indian River Lagoon system. Estimated costs for upgrading to RO were provided by the State of Florida.

All equations used in the calculation of costs are summarized in Appendix B. Appendix C contains more detailed information on how these cost equations apply to each facility.

### 3.1.2 How Was the Cost of Closing Existing Wells Derived?

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<sup>5</sup> See U.S. Environmental Protection Agency, Municipal Support Division, 1996 Clean Water Needs Survey Manual, RUQuS User Instructions, Oct. 1995. Table 12-6: "Wastewater Treatment Cost Curve Equations." Cost formulas are expressed in July 1999 dollars.

<sup>6</sup> See U.S. Environmental Protection Agency, *Construction Costs for Municipal Wastewater Treatment Plants* (430/9-77-011, January 1978). Cost formulae are expressed in July 1999 dollars.

Estimates for well closures are based on a cost of \$200,000 per well, which is based on EPA's review of municipalities' financial responsibility data.

### **3.1.3 How Was the Cost of Constructing an Outfall Derived?**

The estimated cost for constructing a new outfall assumes that each facility will construct a 2-mile, 36-inch pipeline at a cost of \$2000 per foot, installed (about \$21.1 million per outfall). Per-foot sewer-line estimates were not available from the CWNS, so, to approximate average costs for outfalls we used costs provided by EPA from an ocean outfall project in Dewey Beach, Delaware. Like with other parts of the analysis, outfall costs are expected to vary with the circumstances of individual facilities.

### **3.1.4 How Was the Cost of Additional Monitoring Under the Baseline Scenario Derived?**

The estimated cost for monitoring is based on average monitoring costs from EPA's 301(h) Program Information Collection Request (ICR), which estimates monitoring costs for wastewater facilities applying to discharge into certain marine surface waters. Given the monitoring requirements typical of Florida discharges, the sampling and analysis required to comply with the 301(h) program requirements is assumed to be a good estimate of the monitoring that would be required if a municipal wastewater facility were to shift discharge from underground injection to surface disposal. The 301(h) ICR separates facilities into large and small categories for analysis. We used the average monitoring burdens of large facilities for facilities that discharge more than 5 million gallons per day (mgd), and average costs of small facilities for facilities that discharge 5 mgd or less. We then applied these burdens to 1999 labor costs to arrive at a present day cost of monitoring.

### **3.2 What Costs Are Associated with Option 1 (Advanced Treatment)?**

This approach would require facilities that do not already provide advanced treatment to upgrade to some level of advanced treatment (i.e., treatment greater than secondary treatment). It would also entail additional monitoring and a demonstration. The estimated costs for this option (both the high-end estimates and the low-end estimates) are provided in Exhibit 2.



**Exhibit 2**  
**Summary of Costs for Option 1**  
**(Facilities Must Apply Some Level of Advanced Treatment that Ensures that NPDWSs Are Met in the USDW)**

Activity		Capital Costs	Annualized Costs		
			Annualized Capital Costs *	Incremental Annual O&M Costs	Total Annualized Costs
High End Estimates					
Upgrade to Advanced Treatment (<10 mg/l BOD with Nutrient Removal)		1,475,737,802	139,299,209	409,606,522	548,905,731
Upgrade to Advanced Treatment (<10 mg/l BOD w/o Nutrient Removal)		1,141,876,692	107,785,082	409,606,522	517,391,604
Upgrade to Advanced Treatment (10-24 mg/l BOD with Nutrient Removal)		1,075,639,064	101,532,718	409,606,522	511,139,240
Upgrade to Advanced Treatment (10-24 mg/l BOD w/o Nutrient Removal)		805,850,322	76,066,570	409,606,522	485,673,092
Add High-Level Disinfection (some facilities)		175,930,272	16,606,573	19,079,100	35,685,673
Build Additional Monitoring Wells		23,500,000	2,218,234	-	2,218,234
Conduct Additional Monitoring		-	-	877,181	877,181
Conduct Demonstration (For <10 mg/l BOD with NR)		2,504,620	236,418	-	236,418
Conduct Demonstration (For <10 mg/l BOD w/o NR)		5,009,239	472,837	-	472,837
Conduct Demonstration (For 10-24 mg/l BOD with NR)		7,513,859	709,255	-	709,255
Conduct Demonstration (For 10-24 mg/l BOD w/o NR)		10,018,478	945,673	-	945,673
Total (high end)	From	1,015,299,072	95,837,050	429,562,803	525,399,853
	To	1,677,672,693	158,360,434	429,562,803	587,923,237
Total (low end)	From	253,824,768	23,959,262	107,390,701	131,349,963
	To	419,418,173	39,590,108	107,390,701	146,980,809
Cost Per Facility	From	24,173,787	2,281,835	10,227,686	12,509,520
	To	39,944,588	3,770,487	10,227,686	13,998,172

\* Based on a 7% cost of capital and a 20-year period of analysis.

### 3.2.1 How Was the Cost of Upgrading Treatment Derived for Option 1?

For costing purposes, we are providing estimates that reflect four levels of advanced treatment upgrades. The cost curve used for an upgrade to an advanced treatment plant that can achieve <10 mg/L BOD and includes nutrient removal is the same as that given under the Baseline Scenario. The CWNS refers to this level of treatment as an advanced treatment II (AT-II) plant with nutrient removal. The CWNS also provides cost equations for an "AT-II" plant *without* nutrient removal. For advanced treatment to achieve a

BOD level of 10-24 mg/l (with and without nutrient removal), cost curves from the CWNS for an "advanced treatment I (AT-I)" plant were used.

We are also assuming that facilities must upgrade to high-level disinfection with dechlorination. Costs for high-level disinfection were based on sources suggested by the State of Florida (Culp, Wesner, and Culp).<sup>7</sup> Costs for the upgrade to dechlorination are the same as those used in the Baseline Scenario. It is assumed that no RO would be required under Option 1.

Equations used to calculate costs are summarized in Appendix B. Appendix C contains more detailed information on how these cost equations apply to each facility.

### **3.2.2 How Was the Cost of Constructing Additional Monitoring Wells Derived?**

The estimated cost for constructing new monitoring wells assumes that facilities will construct one new monitoring well for every injection well at a cost of \$250,000 per monitoring well. This estimate is an average cost estimated by the State of Florida and EPA based on experience with the installation of other deep monitoring wells in Florida.

### **3.2.3 How Was the Cost of Additional Monitoring Under Option 1 Derived?**

Estimated incremental costs for monitoring are based on average monitoring costs relating to normal drinking water parameters. EPA provided an estimate of the monitoring frequencies and parameters that would be required under the proposed rule. For microbiological monitoring, we estimated costs based on an assumption that monitoring would occur annually. Monitoring for all other parameters was assumed to occur quarterly.<sup>8</sup> Since the facilities in question already sample from existing monitoring wells on a monthly basis, costs for collecting samples were limited to those required from newly installed monitoring wells. Average sampling burdens were estimated based on conversations with engineers with experience in drawing samples from monitoring wells.

### **3.2.4 How Was the Cost for the Demonstration Under Option 1 Derived?**

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<sup>7</sup> See Culp, Wesner, and Culp, *Water Reuse and Recycling* (1979).

<sup>8</sup> Microbial analysis costs based on those from the *Information Collection request for the Information Collection Rule* (Dec. 1993). All other analysis costs based on figures from the proposed *Chemical Monitoring Reform ICR* (Apr. 1998) and the *Public Water System Supervision (PWSS) ICR* (July 1997).

As noted earlier, the demonstration envisioned in Option 1 is much less labor-intensive than the "full" demonstration envisioned in Option 2, below. Specifically, we assumed that demonstration under Option 1 required 10 percent of the effort associated with Option 2's demonstration for the highest level of advanced treatment. Because the demonstration will be more extensive under the less aggressive treatment scenarios, the level of effort required for the demonstration is assumed to increase in 10 percent increments for each successive treatment scenario. The cost for the Option 2 demonstration estimated at \$596,338, which is based on the cost of developing the No-Migration Petitions required of Class 1 hazardous facilities. Ten percent of this cost is \$59,634 per facility (assuming the highest level of advanced treatment. This amount is assumed to increase in 10 percent increments, reaching \$238,535 (40%) for a plant upgrading to the lowest level of advanced treatment.

### **3.3 What Costs are Associated with Option 2 (Demonstration and/or Treatment Upgrade)?**

Option 2 would require existing facilities either to meet national primary drinking water standards at the point of injection (probably meaning that they must provide advanced treatment), or to demonstrate through modeling and monitoring that any fluid that reaches the USDW meets drinking water standards. Costs associated with this approach include conducting a demonstration study, upgrading treatment as necessary, and conducting additional monitoring. These costs are summarized in Exhibit 3, which includes both high-end and low-end estimates.

<b>Exhibit 3</b> <b>Summary of Costs for Option 2</b> <b>(Facilities May Conduct a Demonstration that Identifies Treatment Needed to Protect USDW)</b>					
Activity		Capital Costs	Annualized Costs		
			Annualized Capital Costs *	Incremental Annual O&M Costs	Total Annualized Costs
High End Estimates					
Conduct Demonstration		22,766,646	2,364,184	-	2,364,184
Upgrade to Advanced Treatment - <10 mg/l BOD with Nutrient Removal (75% of the cost in Option 1)		1,106,803,351	104,474,407	307,204,891	411,679,298
Upgrade to Advanced Treatment - <10 mg/l BOD w/o Nutrient Removal (75% of the cost in Option 1)		856,407,519	80,838,811	307,204,891	388,043,703
Upgrade to Advanced Treatment - 10-24 mg/l BOD with Nutrient Removal (75% of the cost in Option 1)		806,729,298	76,149,539	307,204,891	383,354,430
Upgrade to Advanced Treatment - 10-24 mg/l BOD w/o Nutrient Removal (75% of the cost in Option 1)		604,387,742	57,049,927	307,204,891	364,254,819
Add High-Level Disinfection		175,930,272	16,606,573	19,079,100	35,685,673
Build Additional Monitoring Wells		23,500,000	2,218,234	-	2,218,234
Conduct Additional Monitoring		-	-	877,181	877,181
Total (high end)	From	803,084,660	76,020,684	327,161,173	403,181,857
	To	1,329,000,269	125,663,397	327,161,173	452,824,570
Total (low end)	From	200,771,165	19,005,171	81,790,293	100,795,464
	To	332,250,067	31,415,849	81,790,293	113,206,142
Cost Per Facility	From	19,121,063	1,810,016	7,789,552	9,599,568
	To	31,642,864	2,991,986	7,789,552	10,781,537

\* Based on a 7% cost of capital and a 20-year period of analysis.

### 3.3.1 How Was the Cost of a Demonstration Study Derived?

As noted above, the estimated cost for conducting the demonstration study is estimated to be \$596,338 per facility. This is based on the cost of No-Migration Petitions required of Class 1 hazardous facilities.<sup>9</sup> EPA believes that the cost associated with these petitions are comparable to the cost of the demonstration studies contemplated in the proposed regulation.

<sup>9</sup> See U.S. Environmental Protection Agency, Office of Ground Water and Drinking Water, *Underground Injection Control Program—Information Collection Request*, September 30, 1996.

### **3.3.2 How Were the Costs of Treatment Upgrades under Option 2 Derived?**

We assumed the following:

- Facilities that already provide advanced treatment and high-level disinfection will be able to make the required demonstration without upgrading their treatment.
- Twenty-five percent of facilities that do not currently provide advanced treatment and high-level disinfection will be able to make the demonstration without adding advanced treatment (except for high-level disinfection, as described below). The other 75 percent will have to provide advanced treatment. As in Option 1, we are considering four scenarios with regard to the level of advanced treatment upgrade. The total costs for adding advanced treatment will be calculated as 75 percent of the costs calculated for Option 1.
- All facilities that do not already employ high-level disinfection with dechlorination will be required to add it. This is because the facilities will not be able to successfully model the fate and transport of the viruses found in wastewater. Thus, the costs for upgrading to high-level disinfection are the same as in Option 1.

### **3.3.3 How Was the Cost of Constructing Additional Monitoring Wells Derived?**

As in Option 1, we assumed that facilities will construct one new monitoring well for every injection well at a cost of \$250,000 per monitoring well.

### **3.3.4 How Was the Cost of Additional Monitoring under Option 2 Derived?**

Monitoring costs under Option 2 are assumed to be the same as the costs under Option 1.

### 3.4 How do the Costs of the Various Approaches Compare?

Exhibit 4 summarizes the results of the economic analysis:

<b>Exhibit 4</b> <b>Summary of Costs for Each Option</b> <b>(low-end and high-end estimates in millions of 1999 dollars)</b>				
Option	Total Cost (in millions)		Average Cost per Facility - Based on 42 Facilities (in millions)	
	Capital Costs	Annualized Costs (Annualized Cap + O&M)	Capital Costs	Annualized Costs (Annualized Cap + O&M)
Baseline Scenario	721 - 2,882	203 - 811	68.6	19.3
Option 1 (Advanced Treatment)	254 - 1,678	131 - 587	24.1 - 39.9	12.5 - 14
Option 2 (Demonstration and/or Advanced Treatment)	201 - 1,329	101 - 453	19.1 - 31.6	9.6 - 10.8

Appendix D provides per-household costs for the baseline scenario (Appendix D-1) and for the proposed rule (Appendix D-2). Both appendices show costs that would be incurred if fluid movement occurs—in reality, it is unlikely that all wells at all facilities will exhibit fluid movement. In addition, Appendix D-2 shows costs assuming the most aggressive level of advanced treatment under consideration. Per household costs would be lower under different treatment scenarios. Moreover, if Option 2 (the "demonstration option") is promulgated, per-household costs would be substantially lower than shown in Appendix D-2 for those facilities that can demonstrate that they can meet drinking water standards through the provision of existing secondary treatment.

**Appendix A**  
**Existing Class 1 Municipal Wells Affected by the Rule**  
**(42 Facilities)**

Albert Whitted	North Port St. Lucie
Belle Glade	Pahokee
Brentwood WWTP (Atlantic Utilities)	Palm Bay (GDU-Port Malabar)
Broward Co. North Regional	Palm Beach Southern Regional
Coral Springs	Pembroke Pines (Century Village)
East Port (Charlotte)	Plantation (Broward Co.)
East-Central Regional	Rockledge
Encon	Royal Palm Beach
Ft. Myers Beach	Seacoast Utilities
Ft. Pierce Utility Authority	South Beaches
G.T. Lohmeyer	South Collier County
Gasparilla Island	South Cross Bayou
Manatee Co. SW	South Port St. Lucie
Margate	St. Petersburg NE
McKay Creek	St. Petersburg NW
MDW&S North District Regional	St. Petersburg SW
MDW&S South District	Stuart
Melbourne - Grant St.	Sunrise
Miramar WWTP	Sykes Creek (Merritt Island)
North Ft. Myers	West Melbourne
North Port (Charlotte)	West Port (Charlotte)

**Appendix B**  
**Equations Used for Calculation of Treatment Upgrade Costs**

<b>Treatment Upgrade</b>	<b>Cost Equation</b>
AT-II Plant with Nutrient Removal (\$1.00 mgd)	$Cost = 8.131 * 10^6 * flow \text{ in } mgd^{0.830}$
AT-II Plant with Nutrient Removal (<1.00 mgd)	$Cost = 8.131 * 10^6 * flow \text{ in } mgd^{2.131}$
AT-II Plant w/o Nutrient Removal (\$1.00 mgd)	$Cost = 9.19 * 10^6 * flow \text{ in } mgd^{0.750}$
AT-II Plant w/o Nutrient Removal (<1.00 mgd)	$Cost = 9.19 * 10^6 * flow \text{ in } mgd^{2.248}$
AT-I Plant with Nutrient Removal (\$1.00 mgd)	$Cost = 9.58 * 10^6 * flow \text{ in } mgd^{0.728}$
AT-I Plant with Nutrient Removal (<1.00 mgd)	$Cost = 9.58 * 10^6 * flow \text{ in } mgd^{2.287}$
AT-I Plant w/o Nutrient Removal (\$1.00 mgd)	$Cost = 7.99 * 10^6 * flow \text{ in } mgd^{0.740}$
AT-I Plant w/o Nutrient Removal (<1.00 mgd)	$Cost = 7.99 * 10^6 * flow \text{ in } mgd^{2.114}$
Secondary Plant "Salvage Cost"	$Cost = 3.101 * 10^6 * flow \text{ in } mgd^{0.840}$
Chlorination	$Cost = 0.362 * 10^6 * flow \text{ in } mgd^{0.496}$
Dechlorination ( #2 mgd)	$Cost = -14,542 * flow \text{ in } mgd^2 + 53,692 * flow \text{ in } mgd + 11,708$
Dechlorination ( 2 mgd to #20 mgd)	$Cost = -612.21 * flow \text{ in } mgd^2 + 21,184 * flow \text{ in } mgd + 6257.1$
Dechlorination ( >20 mgd)	$Cost = 12.5 * flow \text{ in } mgd^2 + 5873.5 * flow \text{ in } mgd + 73,950$
Advanced Treatment O&M	$Cost = 16.88 * 10^4 * flow \text{ in } mgd^{1.44}$
Secondary Treatment O&M	$Cost = 20.34 * 10^4 * flow \text{ in } mgd^{0.95}$





## **Appendix C**

<b>Appendix C-1</b> <b>Municipal Class I Facilities in</b> <b>Florida</b> <b>Capital Costs for Upgrading</b> <b>to Advanced Treatment with</b> <b>Nutrient Removal</b> <b>(Costs that Apply in Baseline)</b>						
<b>Facility</b>	<b>Apply?</b>	<b>Permitted Treatment Capacity (MGD)</b>	<b>Construction Costs for AT-II Plant with Nutrient Removal (\$99)</b>	<b>Salvage Cost Associated with Existing Secondary Treatment (\$99)</b>	<b>Cost for Upgrade from 2ndary to Advanced</b>	<b>Annualized Costs (At 7% cost of cap)</b>
Albert Whitted	N	12.4	N/A	N/A	N/A	N/A
Belle Glade	N	3	N/A	N/A	N/A	N/A
Brentwood WWTP (Atlantic Utilities)	Y	0.5	1,856,312	1,732,497	123,815	11,687
Broward Co. North Regional	N	80	N/A	N/A	N/A	N/A
Coral Springs	Y	5.5	33,469,325	12,985,015	20,484,310	1,933,574
East Port (Charlotte)	N	5	N/A	N/A	N/A	N/A
East-Central Regional	Y	55	226,280,410	89,834,356	136,446,054	12,879,542
Encon	Y	18	89,541,034	35,153,349	54,387,685	5,133,813
Ft. Myers Beach	N	7.92	N/A	N/A	N/A	N/A
Ft. Pierce Utility Authority	Y	9	50,369,450	19,638,192	30,731,258	2,900,813
G. T. Lohmeyer	Y	43	184,469,573	73,055,228	111,414,345	10,516,726
Gasparilla Island	N	0.705	N/A	N/A	N/A	N/A
Manatee Co. SW	N	18	N/A	N/A	N/A	N/A
Margate	Y	8	45,678,372	17,788,257	27,890,115	2,632,630
McKay Creek	N	6	N/A	N/A	N/A	N/A
MDW&S North District Regional	Y	112.5	409,828,841	163,872,439	245,956,402	23,216,544
MDW&S South District	Y	97	362,381,872	144,685,848	217,696,023	20,548,965
Melbourne - Grant St.	N	5.1	N/A	N/A	N/A	N/A
Miramar WWTP	Y	8.9	49,904,491	19,454,739	30,449,752	2,874,241
North Ft. Myers	N	7.9	N/A	N/A	N/A	N/A
North Port (Charlotte)	N	1.5	N/A	N/A	N/A	N/A
North Port St. Lucie	N	1.5	N/A	N/A	N/A	N/A
Pahokee	N	1.2	N/A	N/A	N/A	N/A
Palm Bay (GDU-Port Malabar)	N	4	N/A	N/A	N/A	N/A
Palm Beach Southern Regional	Y	30	136,822,199	53,990,786	82,831,413	7,818,699
Pembroke Pines (Century Village)	Y	7.69	44,204,327	17,207,427	26,996,901	2,548,316
Plantation (Broward Co.)	Y	30	136,822,199	53,990,786	82,831,413	7,818,699
Rockledge	N	4.5	N/A	N/A	N/A	N/A
Royal Palm Beach	N	6.34	N/A	N/A	N/A	N/A
Seacoast Utilities	N	12	N/A	N/A	N/A	N/A
South Beaches	N	9	N/A	N/A	N/A	N/A
South Collier County	N	1	N/A	N/A	N/A	N/A
South Cross Bayou	Y	33	148,085,486	58,491,062	89,594,424	8,457,080
South Port St. Lucie	N	2.2	N/A	N/A	N/A	N/A
St. Petersburg NE	N	16	N/A	N/A	N/A	N/A
St. Petersburg NW	N	20	N/A	N/A	N/A	N/A
St. Petersburg SW	N	20	N/A	N/A	N/A	N/A
Stuart	Y	4	25,695,420	9,937,295	15,758,125	1,487,455
Sunrise	N	8	N/A	N/A	N/A	N/A
Sykes Creek (Merritt Island)	N	6	N/A	N/A	N/A	N/A
West Melbourne	N	1.9	N/A	N/A	N/A	N/A
West Port (Charlotte)	N	0.33	N/A	N/A	N/A	N/A
<b>Total (high end)</b>	<b>15</b>				<b>1,173,592,034</b>	<b>110,778,786</b>
<b>Total (low end)</b>					<b>293,398,008</b>	<b>27,694,696</b>
<b>Average cost per facility that must upgrade treatment</b>					<b>78,239,469</b>	<b>2,637,590</b>

**Appendix C-2**  
**Municipal Class I Facilities in Florida**  
**Incremental O&M Costs for Upgrading to Advanced Treatment with Nutrient Removal**  
**(Costs that Apply in Baseline Scenario)**

<b>Facility</b>	<b>Apply?</b>	<b>Permitted Treatment Capacity (MGD)</b>	<b>Annual O&amp;M Costs for Advanced Treatment (\$99)</b>	<b>Annual O&amp;M Costs for Secondary Treatment (\$99)</b>	<b>Annual Incremental O&amp;M Cost</b>
Albert Whitted	N	12.4	N/A	N/A	N/A
Belle Glade	N	3	N/A	N/A	N/A
Brentwood WWTP (Atlantic Utilities)	Y	0.5	62,231	105,263	(43,032)
Broward Co. North Regional	N	80	N/A	N/A	N/A
Coral Springs	Y	5.5	1,966,137	1,027,068	939,068
East Port (Charlotte)	N	5	N/A	N/A	N/A
East-Central Regional	Y	55	54,151,898	9,153,756	44,998,142
Encon	Y	18	10,841,361	3,167,843	7,673,518
Ft. Myers Beach	N	7.92	N/A	N/A	N/A
Ft. Pierce Utility Authority	Y	9	3,995,771	1,639,778	2,355,993
G.T. Lohmeyer	Y	43	37,991,460	7,245,191	30,746,270
Gasparilla Island	N	0.705	N/A	N/A	N/A
Manatee Co. SW	N	18	N/A	N/A	N/A
Margate	Y	8	3,372,415	1,466,190	1,906,225
McKay Creek	N	6	N/A	N/A	N/A
MDW&S North District Regional	Y	112.5	151,757,808	18,065,488	133,692,321
MDW&S South District	Y	97	122,586,518	15,692,348	106,894,170
Melbourne - Grant St.	N	5.1	N/A	N/A	N/A
Miramar WWTP	Y	8.9	3,931,996	1,622,465	2,309,531
North Ft. Myers	N	7.9	N/A	N/A	N/A
North Port (Charlotte)	N	1.5	N/A	N/A	N/A
North Port St. Lucie	N	1.5	N/A	N/A	N/A
Pahokee	N	1.2	N/A	N/A	N/A
Palm Bay (GDU-Port Malabar)	N	4	N/A	N/A	N/A
Palm Beach Southern Regional	Y	30	22,622,782	5,146,595	17,476,188
Pembroke Pines (Century Village)	Y	7.69	3,185,850	1,412,163	1,773,687
Plantation (Broward Co.)	Y	30	22,622,782	5,146,595	17,476,188
Rockledge	N	4.5	N/A	N/A	N/A
Royal Palm Beach	N	6.34	N/A	N/A	N/A
Seacoast Utilities	N	12	N/A	N/A	N/A
South Beaches	N	9	N/A	N/A	N/A
South Collier County	N	1	N/A	N/A	N/A
South Cross Bayou	Y	33	25,950,844	5,634,340	20,316,504
South Port St. Lucie	N	2.2	N/A	N/A	N/A
St. Petersburg NE	N	16	N/A	N/A	N/A
St. Petersburg NW	N	20	N/A	N/A	N/A
St. Petersburg SW	N	20	N/A	N/A	N/A
Stuart	Y	4	1,242,962	758,948	484,014
Sunrise	N	8	N/A	N/A	N/A
Sykes Creek (Merritt Island)	N	6	N/A	N/A	N/A
West Melbourne	N	1.9	N/A	N/A	N/A
West Port (Charlotte)	N	0.33	N/A	N/A	N/A
<b>Total (high end)</b>	<b>15</b>				<b>388,998,786</b>
<b>Total (low end)</b>					<b>97,249,697</b>
<b>Average cost per facility that must upgrade treatment</b>					<b>25,933,252</b>

<b>Appendix C-3</b> <b>Municipal Class I Facilities in Florida</b> <b>Capital Costs for Upgrading to Basic Disinfection Plus</b> <b>Dechlorination</b> <b>(Costs that Apply in Baseline Scenario)</b>						
<b>Facility</b>	<b>Apply?</b>	<b>Permitted Treatment Capacity (MGD)</b>	<b>Capital Costs for Chlorination (\$99)</b>	<b>Capital Costs for Dechlorination (\$99)</b>	<b>Total Capital Costs (\$99)</b>	<b>Annualized Costs (At 7% cost of cap)</b>
Albert Whitted	N	12.4	N/A	N/A	N/A	N/A
Belle Glade	N	3	N/A	N/A	N/A	N/A
Brentwood WWTP (Atlantic Utilities)	Y	0.5	256,642	23,222	279,864	26,417
Broward Co. North Regional	N	80	N/A	N/A	N/A	N/A
Coral Springs	Y	5.5	843,060	104,250	947,310	89,419
East Port (Charlotte)	Y	5	804,133	96,872	901,005	85,048
East-Central Regional	N	55	N/A	N/A	N/A	N/A
Encon	N	18	N/A	N/A	N/A	N/A
Ft. Myers Beach	N	7.92	N/A	N/A	N/A	N/A
Ft. Pierce Utility Authority	Y	9	1,076,324	147,324	1,223,648	115,504
G.T. Lohmeyer	Y	43	2,337,970	349,623	2,687,593	253,690
Gasparilla Island	N	0.705	N/A	N/A	N/A	N/A
Manatee Co. SW	N	18	N/A	N/A	N/A	N/A
Margate	Y	8	1,015,246	136,548	1,151,794	108,721
McKay Creek	Y	6	880,241	111,322	991,563	93,596
MDW&S North District Regional	N	112.5	N/A	N/A	N/A	N/A
MDW&S South District	N	97	N/A	N/A	N/A	N/A
Melbourne - Grant St.	N	5.1	N/A	N/A	N/A	N/A
Miramar WWTP	Y	8.9	1,070,375	146,302	1,216,677	114,846
North Ft. Myers	N	7.9	N/A	N/A	N/A	N/A
North Port (Charlotte)	N	1.5	N/A	N/A	N/A	N/A
North Port St. Lucie	N	1.5	N/A	N/A	N/A	N/A
Pahokee	Y	1.2	396,198	43,502	439,700	41,505
Palm Bay (GDU-Port Malabar)	N	4	N/A	N/A	N/A	N/A
Palm Beach Southern	N	30	N/A	N/A	N/A	N/A
Pembroke Pines (Century Village)	Y	7.69	995,539	132,958	1,128,497	106,522
Plantation (Broward Co.)	N	30	N/A	N/A	N/A	N/A
Rockledge	N	4.5	N/A	N/A	N/A	N/A
Royal Palm Beach	N	6.34	N/A	N/A	N/A	N/A
Seacoast Utilities	N	12	N/A	N/A	N/A	N/A
South Beaches	N	9	N/A	N/A	N/A	N/A
South Collier County	N	1	N/A	N/A	N/A	N/A
South Cross Bayou	N	33	N/A	N/A	N/A	N/A
South Port St. Lucie	N	2.2	N/A	N/A	N/A	N/A
St. Petersburg NE	N	16	N/A	N/A	N/A	N/A
St. Petersburg NW	N	20	N/A	N/A	N/A	N/A
St. Petersburg SW	N	20	N/A	N/A	N/A	N/A
Stuart	Y	4	719,880	81,198	801,078	75,616
Sunrise	N	8	N/A	N/A	N/A	N/A
Sykes Creek (Merritt Island)	N	6	N/A	N/A	N/A	N/A
West Melbourne	Y	1.9	497,623	49,530	547,153	51,647
West Port (Charlotte)	Y	0.33	208,844	16,146	224,990	21,237
<b>Total (high end)</b>	<b>13</b>				<b>12,540,871</b>	<b>1,183,769</b>
<b>Total (low end)</b>					<b>3,135,218</b>	<b>295,942</b>

Average cost per facility that must upgrade treatment

964,682

91,059

**Appendix C-4**  
**Municipal Class I Facilities in Florida**  
**Incremental Annual O&M Costs for Upgrading to Basic Disinfection Plus**  
**Dechlorination**  
**(Costs that Apply in Baseline Scenario)**

Facility	Apply ?	Permitted Treatment Capacity (MGD)	O&M Costs for Basic Disinfection With Dechlorination (Assumed same as HLD)	Total Annual O&M Costs
Albert Whitted	N	12.4	N/A	N/A
Belle Glade	N	3	N/A	N/A
Brentwood WWTP (Atlantic Utilities)	Y	0.5	36,135	36,135
Broward Co. North Regional	N	80	N/A	N/A
Coral Springs	Y	5.5	352,572	352,572
East Port (Charlotte)	Y	5	322,051	322,051
East-Central Regional	N	55	N/A	N/A
Encon	N	18	N/A	N/A
Ft. Myers Beach	N	7.92	N/A	N/A
Ft. Pierce Utility Authority	Y	9	562,903	562,903
G.T. Lohmeyer	Y	43	2,487,129	2,487,129
Gasparilla Island	N	0.705	N/A	N/A
Manatee Co. SW	N	18	N/A	N/A
Margate	Y	8	503,314	503,314
McKay Creek	Y	6	382,954	382,954
MDW&S North District Regional	N	112.5	N/A	N/A
MDW&S South District	N	97	N/A	N/A
Melbourne - Grant St.	N	5.1	N/A	N/A
Miramar WWTP	Y	8.9	556,960	556,960
North Ft. Myers	N	7.9	N/A	N/A
North Port (Charlotte)	N	1.5	N/A	N/A
North Port St. Lucie	N	1.5	N/A	N/A
Pahokee	Y	1.2	9,559	9,559
Palm Bay (GDU-Port Malabar)	N	4	N/A	N/A
Palm Beach Southern Regional	N	30	N/A	N/A
Pembroke Pines (Century Village)	Y	7.69	484,767	484,767
Plantation (Broward Co.)	N	30	N/A	N/A
Rockledge	N	4.5	N/A	N/A
Royal Palm Beach	N	6.34	N/A	N/A
Seacoast Utilities	N	12	N/A	N/A
South Beaches	N	9	N/A	N/A
South Collier County	N	1	N/A	N/A
South Cross Bayou	N	33	N/A	N/A
South Port St. Lucie	N	2.2	N/A	N/A
St. Petersburg NE	N	16	N/A	N/A
St. Petersburg NW	N	20	N/A	N/A
St. Petersburg SW	N	20	N/A	N/A
Stuart	Y	4	260,532	260,532
Sunrise	N	8	N/A	N/A
Sykes Creek (Merritt Island)	N	6	N/A	N/A
West Melbourne	Y	1.9	14,791	14,791
West Port (Charlotte)	Y	0.33	24,350	24,350
<b>Total (high end)</b>	<b>13</b>			<b>5,998,016</b>
<b>Total (low end)</b>				<b>1,499,504</b>
<b>Average cost per facility that must upgrade treatment</b>				<b>461,386</b>

<b>Appendix C-5 Municipal Class I Facilities in Florida Capital Costs for Upgrading to Reverse Osmosis (Costs that Apply in</b>						
<b>Facility</b>	<b>Apply?</b>	<b>Permitted Treatment Capacity (MGD)</b>	<b>Salvage Cost Associated with Existing Advanced Treatment (\$99)</b>	<b>Salvage Cost Associated with Existing Treatment (2ndary or Adv) (\$99)</b>	<b>Cost for Upgrade to RO</b>	<b>Annualized Costs (At 7% cost of cap)</b>
Albert Whitted	Y	12.4	65,718,240	65,718,240	32,474,723	3,065,384
Belle Glade	Y	3	20,237,486	7,804,043	23,268,054	2,196,340
Brentwood WWTP (Atlantic Utilities)	N	0.5	N/A	N/A	N/A	N/A
Broward Co. North Regional	N	80	N/A	N/A	N/A	N/A
Coral Springs	N	5.5	N/A	N/A	N/A	N/A
East Port (Charlotte)	Y	5	30,923,670	11,985,954	35,493,425	3,350,328
East-Central Regional	N	55	N/A	N/A	N/A	N/A
Encon	N	18	N/A	N/A	N/A	N/A
Ft. Myers Beach	Y	7.92	45,298,918	17,638,715	45,136,947	4,260,608
Ft. Pierce Utility Authority	N	9	N/A	N/A	N/A	N/A
G.T. Lohmeyer	N	43	N/A	N/A	N/A	N/A
Gasparilla Island	Y	0.705	6,083,351	2,312,153	6,973,047	658,206
Manatee Co. SW	Y	18	89,541,034	35,153,349	102,325,570	9,658,810
Margate	N	8	N/A	N/A	N/A	N/A
McKay Creek	Y	6	35,975,883	13,969,628	41,266,785	3,895,293
MDW&S North District Regional	N	112.5	N/A	N/A	N/A	N/A
MDW&S South District	N	97	N/A	N/A	N/A	N/A
Melbourne - Grant St.	Y	5.1	31,436,137	12,186,998	35,292,381	3,331,351
Miramar WWTP	N	8.9	N/A	N/A	N/A	N/A
North Ft. Myers	Y	7.9	45,203,953	17,601,292	45,174,370	4,264,141
North Port (Charlotte)	Y	1.5	11,384,178	4,359,678	13,119,285	1,238,368
North Port St. Lucie	Y	1.5	11,384,178	4,359,678	13,119,285	1,238,368
Pahokee	Y	1.2	9,459,460	9,459,460	3,024,717	285,512
Palm Bay (GDU-Port Malabar)	Y	4	25,695,420	9,937,295	29,514,768	2,785,985
Palm Beach Southern Regional	N	30	N/A	N/A	N/A	N/A
Pembroke Pines (Century Village)	N	7.69	N/A	N/A	N/A	N/A
Plantation (Broward Co.)	N	30	N/A	N/A	N/A	N/A
Rockledge	Y	4.5	28,334,288	10,970,750	28,481,314	2,688,435
Royal Palm Beach	Y	6.34	37,659,973	14,631,632	40,604,781	3,832,804
Seacoast Utilities	Y	12	63,953,801	25,006,335	73,186,628	6,908,300
South Beaches	N	9	N/A	N/A	N/A	N/A
South Collier County	Y	1	8,131,037	8,131,037	4,353,141	410,906
South Cross Bayou	N	33	N/A	N/A	N/A	N/A
South Port St. Lucie	Y	2.2	15,644,322	6,014,131	16,178,809	1,527,165
St. Petersburg NE	Y	16	81,201,773	81,201,773	43,473,267	4,103,569
St. Petersburg NW	Y	20	97,723,907	97,723,907	52,318,778	4,938,522
St. Petersburg SW	Y	20	97,723,907	97,723,907	52,318,778	4,938,522
Stuart	N	4	N/A	N/A	N/A	N/A
Sunrise	Y	8	45,678,372	45,678,372	24,454,984	2,308,377
Sykes Creek (Merritt Island)	Y	6	35,975,883	35,975,883	19,260,530	1,818,058
West Melbourne	Y	1.9	13,851,966	13,851,966	6,012,711	567,557
West Port (Charlotte)	Y	0.33	3,239,757	1,222,051	3,373,849	318,467
<b>Total (high end)</b>	<b>25</b>				<b>790,200,924</b>	<b>74,589,377</b>
<b>Total (low end)</b>					<b>197,550,231</b>	<b>18,647,344</b>
<b>Average cost per facility that must upgrade treatment</b>					<b>31,608,037</b>	<b>1,775,938</b>

**Appendix C-6**  
**Municipal Class I Facilities in Florida**  
**Incremental O&M Costs for Upgrading to Reverse Osmosis**  
**(Costs that Apply in Baseline Scenario)**

<b>Facility</b>	<b>Apply?</b>	<b>Permitted Treatment Capacity (MGD)</b>	<b>O&amp;M Cost Associated with Existing Advanced Treatment (\$99)</b>	<b>Annual O&amp;M Associated with Current Treatment (2ndary or Adv) (\$99)</b>	<b>Incremental Increase in O&amp;M Cost</b>
Albert Whitted	Y	12.4	6,338,969	6,338,969	6,342,389
Belle Glade	Y	3	333,231	577,457	2,820,428
Brentwood WWTP (Atlantic Utilities)	N	0.5	N/A	N/A	N/A
Broward Co. North Regional	N	80	N/A	N/A	N/A
Coral Springs	N	5.5	N/A	N/A	N/A
East Port (Charlotte)	Y	5	695,356	938,159	4,582,172
East-Central Regional	N	55	N/A	N/A	N/A
Encon	N	18	N/A	N/A	N/A
Ft. Myers Beach	Y	7.92	1,348,512	1,452,258	6,147,272
Ft. Pierce Utility Authority	N	9	N/A	N/A	N/A
G.T. Lohmeyer	N	43	N/A	N/A	N/A
Gasparilla Island	Y	0.705	41,408	145,893	706,788
Manatee Co. SW	Y	18	4,398,281	3,167,843	15,472,439
Margate	N	8	N/A	N/A	N/A
McKay Creek	Y	6	904,125	1,115,574	5,448,709
MDW&S North District Regional	N	112.5	N/A	N/A	N/A
MDW&S South District	N	97	N/A	N/A	N/A
Melbourne - Grant St.	Y	5.1	715,470	955,975	4,564,356
Miramar WWTP	N	8.9	N/A	N/A	N/A
North Ft. Myers	Y	7.9	1,343,611	1,448,774	6,150,756
North Port (Charlotte)	Y	1.5	122,818	298,911	1,459,945
North Port St. Lucie	Y	1.5	122,818	298,911	1,459,945
Pahokee	Y	1.2	89,066	89,066	1,107,519
Palm Bay (GDU-Port Malabar)	Y	4	504,263	758,948	3,706,866
Palm Beach Southern Regional	N	30	N/A	N/A	N/A
Pembroke Pines (Century Village)	N	7.69	N/A	N/A	N/A
Plantation (Broward Co.)	N	30	N/A	N/A	N/A
Rockledge	Y	4.5	597,471	848,803	3,617,011
Royal Palm Beach	Y	6.34	978,812	1,175,546	5,388,737
Seacoast Utilities	Y	12	2,453,079	2,155,147	10,526,211
South Beaches	N	9	N/A	N/A	N/A
South Collier County	Y	1	68,500	68,500	1,128,085
South Cross Bayou	N	33	N/A	N/A	N/A
South Port St. Lucie	Y	2.2	213,196	430,087	1,881,563
St. Petersburg NE	Y	16	3,712,131	3,712,131	12,954,874
St. Petersburg NW	Y	20	5,118,866	5,118,866	15,483,737
St. Petersburg SW	Y	20	5,118,866	5,118,866	15,483,737
Stuart	N	4	N/A	N/A	N/A
Sunrise	Y	8	1,368,170	1,368,170	7,259,213
Sykes Creek (Merritt Island)	Y	6	904,125	904,125	5,660,158
West Melbourne	Y	1.9	172,622	172,622	1,863,622
West Port (Charlotte)	Y	0.33	13,879	70,932	310,317
<b>Total (high end)</b>	<b>25</b>				<b>141,526,851</b>
<b>Total (low end)</b>					<b>35,381,713</b>
<b>Average cost per facility that must upgrade treatment</b>					<b>5,661,074</b>



**Appendix C-7**  
**Municipal Class I Facilities in Florida**  
**Well Closure Costs**  
**(Costs that Apply in Baseline Scenario)**

<i>Facility</i>	<i>Apply?</i>	<i>Number Wells</i>	<i>Closure Cost/Well</i>	<i>Well Closure Cost</i>	<i>Annualized Costs (At 7% cost of cap)</i>
Albert Whitted	Y	2	200,000	400,000	400,000
Belle Glade	Y	1	200,000	200,000	18,879
Brentwood WWTP (Atlantic Utilities)	Y	1	200,000	200,000	18,879
Broward Co. North Regional	Y	6	200,000	1,200,000	113,272
Coral Springs	Y	2	200,000	400,000	37,757
East Port (Charlotte)	Y	1	200,000	200,000	18,879
East-Central Regional	Y	6	200,000	1,200,000	113,272
Encon	Y	1	200,000	200,000	18,879
Ft. Myers Beach	Y	1	200,000	200,000	18,879
Ft. Pierce Utility Authority	Y	1	200,000	200,000	18,879
G.T. Lohmeyer	Y	5	200,000	1,000,000	94,393
Gasparilla Island	Y	1	200,000	200,000	18,879
Manatee Co. SW	Y	1	200,000	200,000	18,879
Margate	Y	2	200,000	400,000	37,757
McKay Creek	Y	2	200,000	400,000	37,757
MDW&S North District Regional	Y	4	200,000	800,000	75,514
MDW&S South District	Y	17	200,000	3,400,000	320,936
Melbourne - Grant St.	Y	1	200,000	200,000	18,879
Miramar WWTP	Y	2	200,000	400,000	37,757
North Ft. Myers	Y	1	200,000	200,000	18,879
North Port (Charlotte)	Y	1	200,000	200,000	18,879
North Port St. Lucie	Y	1	200,000	200,000	18,879
Pahokee	Y	1	200,000	200,000	18,879
Palm Bay (GDU-Port Malabar)	Y	1	200,000	200,000	18,879
Palm Beach Southern Regional	Y	2	200,000	400,000	37,757
Pembroke Pines (Century Village)	Y	2	200,000	400,000	37,757
Plantation (Broward Co.)	Y	2	200,000	400,000	37,757
Rockledge	Y	1	200,000	200,000	18,879
Royal Palm Beach	Y	1	200,000	200,000	18,879
Seacoast Utilities	Y	1	200,000	200,000	18,879
South Beaches	Y	1	200,000	200,000	18,879
South Collier County	Y	1	200,000	200,000	18,879
South Cross Bayou	Y	3	200,000	600,000	56,636
South Port St. Lucie	Y	1	200,000	200,000	18,879
St. Petersburg NE	Y	3	200,000	600,000	56,636
St. Petersburg NW	Y	2	200,000	400,000	37,757
St. Petersburg SW	Y	3	200,000	600,000	56,636
Stuart	Y	2	200,000	400,000	37,757
Sunrise	Y	3	200,000	600,000	56,636
Sykes Creek (Merritt Island)	Y	2	200,000	400,000	37,757
West Melbourne	Y	1	200,000	200,000	18,879
West Port (Charlotte)	Y	1	200,000	200,000	18,879
<b>Total (high end)</b>	<b>42</b>			<b>18,800,000</b>	<b>2,136,830</b>
<b>Total (low end)</b>				<b>4,700,000</b>	<b>534,207</b>
<b>Average Cost per Facility</b>				<b>447,619</b>	<b>50,877</b>

**Appendix C-8**  
**Municipal Class I Facilities in Florida**  
**Cost to Construct New Outfall**  
**(Costs that Apply in Baseline Scenario)**

<b>Facility</b>	<b>Apply?</b>	<b>Outfall Cost</b>	<b>Annualized Costs (At 7% cost of cap)</b>
Albert Whitted	Y	21,120,000	1,993,579
Belle Glade	Y	21,120,000	1,993,579
Brentwood WWTP (Atlantic Utilities)	Y	21,120,000	1,993,579
Broward Co. North Regional	Y	21,120,000	1,993,579
Coral Springs	Y	21,120,000	1,993,579
East Port (Charlotte)	Y	21,120,000	1,993,579
East-Central Regional	Y	21,120,000	1,993,579
Encon	Y	21,120,000	1,993,579
Ft. Myers Beach	Y	21,120,000	1,993,579
Ft. Pierce Utility Authority	Y	21,120,000	1,993,579
G.T. Lohmeyer	Y	21,120,000	1,993,579
Gasparilla Island	Y	21,120,000	1,993,579
Manatee Co. SW	Y	21,120,000	1,993,579
Margate	Y	21,120,000	1,993,579
McKay Creek	Y	21,120,000	1,993,579
MDW&S North District Regional	Y	21,120,000	1,993,579
MDW&S South District	Y	21,120,000	1,993,579
Melbourne - Grant St.	Y	21,120,000	1,993,579
Miramar WWTP	Y	21,120,000	1,993,579
North Ft. Myers	Y	21,120,000	1,993,579
North Port (Charlotte)	Y	21,120,000	1,993,579
North Port St. Lucie	Y	21,120,000	1,993,579
Pahokee	Y	21,120,000	1,993,579
Palm Bay (GDU-Port Malabar)	Y	21,120,000	1,993,579
Palm Beach Southern Regional	Y	21,120,000	1,993,579
Pembroke Pines (Century Village)	Y	21,120,000	1,993,579
Plantation (Broward Co.)	Y	21,120,000	1,993,579
Rockledge	Y	21,120,000	1,993,579
Royal Palm Beach	Y	21,120,000	1,993,579
Seacoast Utilities	Y	21,120,000	1,993,579
South Beaches	Y	21,120,000	1,993,579
South Collier County	Y	21,120,000	1,993,579
South Cross Bayou	Y	21,120,000	1,993,579
South Port St. Lucie	Y	21,120,000	1,993,579
St. Petersburg NE	Y	21,120,000	1,993,579
St. Petersburg NW	Y	21,120,000	1,993,579
St. Petersburg SW	Y	21,120,000	1,993,579
Stuart	Y	21,120,000	1,993,579
Sunrise	Y	21,120,000	1,993,579
Sykes Creek (Merritt Island)	Y	21,120,000	1,993,579
West Melbourne	Y	21,120,000	1,993,579
West Port (Charlotte)	Y	21,120,000	1,993,579
<b>Total (high end)</b>	<b>42</b>	<b>887,040,000</b>	<b>83,730,301</b>
<b>Total (low end)</b>		<b>221,760,000</b>	<b>20,932,575</b>
<b>Average Cost per Facility</b>		<b>21,120,000</b>	<b>1,993,579</b>

**Appendix C-9**  
**Municipal Class I Facilities in Florida**  
**Monitoring Costs**  
**(Costs that Apply in Baseline Scenario)**

<i>Facility</i>	<i>Apply?</i>	<i>Permitted Treatment Capacity (MGD)</i>	<i>Estimated Monitoring Burden (per 301(h) ICR)</i>	<i>Estimate of Monitoring Costs</i>
<i>Albert Whitted</i>	Y	12.4	1,760	64,430
<i>Belle Glade</i>	Y	3	328	12,007
<i>Brentwood WWTP (Atlantic Utilities)</i>	Y	0.5	328	12,007
<i>Broward Co. North Regional</i>	Y	80	1,760	64,430
<i>Coral Springs</i>	Y	5.5	1,760	64,430
<i>East Port (Charlotte)</i>	Y	5	328	12,007
<i>East-Central Regional</i>	Y	55	1,760	64,430
<i>Encon</i>	Y	18	1,760	64,430
<i>Ft. Myers Beach</i>	Y	7.92	1,760	64,430
<i>Ft. Pierce Utility Authority</i>	Y	9	1,760	64,430
<i>G.T. Lohmeyer</i>	Y	43	1,760	64,430
<i>Gasparilla Island</i>	Y	0.705	328	12,007
<i>Manatee Co. SW</i>	Y	18	1,760	64,430
<i>Margate</i>	Y	8	1,760	64,430
<i>McKay Creek</i>	Y	6	1,760	64,430
<i>MDW&amp;S North District Regional</i>	Y	112.5	1,760	64,430
<i>MDW&amp;S South District</i>	Y	97	1,760	64,430
<i>Melbourne - Grant St.</i>	Y	5.1	1,760	64,430
<i>Miramar WWTP</i>	Y	8.9	1,760	64,430
<i>North Ft. Myers</i>	Y	7.9	1,760	64,430
<i>North Port (Charlotte)</i>	Y	1.5	328	12,007
<i>North Port St. Lucie</i>	Y	1.5	328	12,007
<i>Pahokee</i>	Y	1.2	328	12,007
<i>Palm Bay (GDU-Port Malabar)</i>	Y	4	328	12,007
<i>Palm Beach Southern Regional</i>	Y	30	1,760	64,430
<i>Pembroke Pines (Century Village)</i>	Y	7.69	1,760	64,430
<i>Plantation (Broward Co.)</i>	Y	30	1,760	64,430
<i>Rockledge</i>	Y	4.5	328	12,007
<i>Royal Palm Beach</i>	Y	6.34	1,760	64,430
<i>Seacoast Utilities</i>	Y	12	1,760	64,430
<i>South Beaches</i>	Y	9	1,760	64,430
<i>South Collier County</i>	Y	1	328	12,007
<i>South Cross Bayou</i>	Y	33	1,760	64,430
<i>South Port St. Lucie</i>	Y	2.2	328	12,007
<i>St. Petersburg NE</i>	Y	16	1,760	64,430
<i>St. Petersburg NW</i>	Y	20	1,760	64,430
<i>St. Petersburg SW</i>	Y	20	1,760	64,430
<i>Stuart</i>	Y	4	328	12,007
<i>Sunrise</i>	Y	8	1,760	64,430
<i>Sykes Creek (Merritt Island)</i>	Y	6	1,760	64,430
<i>West Melbourne</i>	Y	1.9	328	12,007
<i>West Port (Charlotte)</i>	Y	0.33	328	12,007
<b>Total (high end)</b>	<b>42</b>			<b>1,972,146</b>
<b>Total (low end)</b>				<b>493,037</b>
<b>Average Cost per Facility</b>				<b>46,956</b>

**Appendix C-10**  
**Municipal Class I Facilities in Florida**  
**Capital Costs for Upgrading to Advanced Treatment (10-24 mg/l BOD w/o Nutrient Removal)**  
**(Costs that Apply in Option 1)**

Facility	Apply?	Permitted Treatment Capacity (MGD)	Construction Costs for AT-I Plant w/o Nutrient Removal	Salvage Cost Associated with Existing Secondary Treatment	Cost for Upgrade from 2ndary to Advanced	Annualized Costs (At 7% cost of cap)
Albert Whitted	N	12.4	N/A	N/A	N/A	N/A
Belle Glade	Y	3	18,007,320	7,804,043	10,203,277	963,117
Brentwood WWTP (Atlantic Utilities)	Y	0.5	1,845,024	1,732,497	112,526	10,622
Broward Co. North Regional	N	80	N/A	N/A	N/A	N/A
Coral Springs	Y	5.5	28,199,911	12,985,015	15,214,896	1,436,179
East Port (Charlotte)	Y	5	26,279,503	11,985,954	14,293,549	1,349,210
East-Central Regional	Y	55	154,970,036	89,834,356	65,135,680	6,148,347
Encon	Y	18	67,808,010	35,153,349	32,654,661	3,082,369
Ft. Myers Beach	Y	7.92	36,934,819	17,638,715	19,296,104	1,821,416
Ft. Pierce Utility Authority	Y	9	40,599,324	19,638,192	20,961,132	1,978,583
G.T. Lohmeyer	Y	43	129,165,342	73,055,228	56,110,114	5,296,398
Gasparilla Island	Y	0.705	3,814,619	2,312,153	1,502,465	141,822
Manatee Co. SW	Y	18	67,808,010	35,153,349	32,654,661	3,082,369
Margate	Y	8	37,210,537	17,788,257	19,422,280	1,833,326
McKay Creek	Y	6	30,075,390	13,969,628	16,105,762	1,520,270
MDW&S North District Regional	Y	112.5	263,167,472	163,872,439	99,295,034	9,372,749
MDW&S South District	Y	97	235,825,317	144,685,848	91,139,468	8,602,921
Melbourne - Grant St.	Y	5.1	26,667,437	12,186,998	14,480,439	1,366,851
Miramar WWTP	Y	8.9	40,265,023	19,454,739	20,810,284	1,964,344
North Ft. Myers	Y	7.9	36,865,777	17,601,292	19,264,485	1,818,431
North Port (Charlotte)	Y	1.5	10,781,691	4,359,678	6,422,012	606,193
North Port St. Lucie	Y	1.5	10,781,691	4,359,678	6,422,012	606,193
Pahokee	N	1.2	N/A	N/A	N/A	N/A
Palm Bay (GDU-Port Malabar)	Y	4	22,279,413	9,937,295	12,342,117	1,165,009
Palm Beach Southern Regional	Y	30	98,957,581	53,990,786	44,966,795	4,244,547
Pembroke Pines (Century Village)	Y	7.69	36,138,060	17,207,427	18,930,633	1,786,918
Plantation (Broward Co.)	Y	30	98,957,581	53,990,786	44,966,795	4,244,547
Rockledge	Y	4.5	24,308,413	10,970,750	13,337,663	1,258,981
Royal Palm Beach	Y	6.34	31,327,475	14,631,632	16,695,843	1,575,969
Seacoast Utilities	Y	12	50,231,190	25,006,335	25,224,855	2,381,048
South Beaches	N	9	N/A	N/A	N/A	N/A
South Collier County	N	1	N/A	N/A	N/A	N/A
South Cross Bayou	Y	33	106,189,031	58,491,062	47,697,969	4,502,351
South Port St. Lucie	Y	2.2	14,314,366	6,014,131	8,300,236	783,484
St. Petersburg NE	N	16	N/A	N/A	N/A	N/A
St. Petersburg NW	N	20	N/A	N/A	N/A	N/A
St. Petersburg SW	N	20	N/A	N/A	N/A	N/A
Stuart	Y	4	22,279,413	9,937,295	12,342,117	1,165,009
Sunrise	N	8	N/A	N/A	N/A	N/A
Sykes Creek (Merritt Island)	N	6	N/A	N/A	N/A	N/A
West Melbourne	N	1.9	N/A	N/A	N/A	N/A
West Port (Charlotte)	Y	0.33	766,510	1,222,051	(455,542)	(43,000)
<b>Total (high end)</b>	<b>31</b>				<b>805,850,322</b>	<b>76,066,570</b>
<b>Total (low end)</b>					<b>201,462,581</b>	<b>19,016,642</b>
<b>Average Cost per Facility that must install treatment</b>					<b>25,995,172</b>	<b>2,453,760</b>

**Appendix C-11**  
**Municipal Class I Facilities in Florida**  
**Capital Costs for Upgrading to Advanced Treatment (10-24 mg/l BOD with Nutrient Removal)**  
**(Costs that Apply in Option 1)**

Facility	Apply?	Permitted Treatment Capacity (MGD)	Construction Costs for AT-I Plant with Nutrient Removal	Salvage Cost Associated with Existing Secondary Treatment	Cost for Upgrade from 2ndary to Advanced	Annualized Costs (At 7% cost of cap)
Albert Whitted	N	12.4	N/A	N/A	N/A	N/A
Belle Glade	Y	3	21,308,642	7,804,043	13,504,599	1,274,739
Brentwood WWTP (Atlantic Utilities)	Y	0.5	1,962,257	1,732,497	229,760	21,688
Broward Co. North Regional	N	80	N/A	N/A	N/A	N/A
Coral Springs	Y	5.5	33,128,024	12,985,015	20,143,009	1,901,358
East Port (Charlotte)	Y	5	30,907,342	11,985,954	18,921,388	1,786,045
East-Central Regional	Y	55	177,090,611	89,834,356	87,256,255	8,236,373
Encon	Y	18	78,532,583	35,153,349	43,379,234	4,094,693
Ft. Myers Beach	Y	7.92	43,199,968	17,638,715	25,561,253	2,412,801
Ft. Pierce Utility Authority	Y	9	47,413,285	19,638,192	27,775,093	2,621,772
G.T. Lohmeyer	Y	43	148,039,133	73,055,228	74,983,905	7,077,950
Gasparilla Island	Y	0.705	4,305,464	2,312,153	1,993,311	188,154
Manatee Co. SW	Y	18	78,532,583	35,153,349	43,379,234	4,094,693
Margate	Y	8	43,517,206	17,788,257	25,728,950	2,428,631
McKay Creek	Y	6	35,294,384	13,969,628	21,324,756	2,012,906
MDW&S North District Regional	Y	112.5	298,160,792	163,872,439	134,288,354	12,675,871
MDW&S South District	Y	97	267,658,673	144,685,848	122,972,824	11,607,765
Melbourne - Grant St.	Y	5.1	31,356,139	12,186,998	19,169,141	1,809,431
Miramar WWTP	Y	8.9	47,029,182	19,454,739	27,574,443	2,602,832
North Ft. Myers	Y	7.9	43,120,523	17,601,292	25,519,231	2,408,835
North Port (Charlotte)	Y	1.5	12,864,886	4,359,678	8,505,207	802,831
North Port St. Lucie	Y	1.5	12,864,886	4,359,678	8,505,207	802,831
Pahokee	N	1.2	N/A	N/A	N/A	N/A
Palm Bay (GDU-Port Malabar)	Y	4	26,273,091	9,937,295	16,335,796	1,541,984
Palm Beach Southern Regional	Y	30	113,908,405	53,990,786	59,917,619	5,655,799
Pembroke Pines (Century Village)	Y	7.69	42,283,008	17,207,427	25,075,581	2,366,957
Plantation (Broward Co.)	Y	30	113,908,405	53,990,786	59,917,619	5,655,799
Rockledge	Y	4.5	28,625,311	10,970,750	17,654,561	1,666,466
Royal Palm Beach	Y	6.34	36,739,435	14,631,632	22,107,803	2,086,820
Seacoast Utilities	Y	12	58,459,547	25,006,335	33,453,212	3,157,747
South Beaches	N	9	N/A	N/A	N/A	N/A
South Collier County	N	1	N/A	N/A	N/A	N/A
South Cross Bayou	Y	33	122,092,685	58,491,062	63,601,623	6,003,543
South Port St. Lucie	Y	2.2	17,001,812	6,014,131	10,987,681	1,037,159
St. Petersburg NE	N	16	N/A	N/A	N/A	N/A
St. Petersburg NW	N	20	N/A	N/A	N/A	N/A
St. Petersburg SW	N	20	N/A	N/A	N/A	N/A
Stuart	Y	4	26,273,091	9,937,295	16,335,796	1,541,984
Sunrise	N	8	N/A	N/A	N/A	N/A
Sykes Creek (Merritt Island)	N	6	N/A	N/A	N/A	N/A
West Melbourne	N	1.9	N/A	N/A	N/A	N/A
West Port (Charlotte)	Y	0.33	758,670	1,222,051	(463,382)	(43,740)
<b>Total (high end)</b>	<b>31</b>				<b>1,075,639,064</b>	<b>101,532,718</b>
<b>Total (low end)</b>					<b>268,909,766</b>	<b>25,383,180</b>
<b>Average cost per facility that must upgrade treatment</b>					<b>34,698,034</b>	<b>3,275,249</b>

**Appendix C-12**  
**Municipal Class I Facilities in Florida**  
**Capital Costs for Upgrading to Advanced Treatment (<10 mg/l BOD w/o Nutrient Removal)**  
**(Costs that Apply in Option 1)**

Facility	Apply?	Permitted Treatment Capacity (MGD)	Construction Costs for AT-II Plant w/o Nutrient Removal	Salvage Cost Associated with Existing Secondary Treatment	Cost for Upgrade from 2ndary to Advanced	Annualized Costs (At 7% cost of cap)
Albert Whitted	N	12.4	N/A	N/A	N/A	N/A
Belle Glade	Y	3	20,957,239	7,804,043	13,153,196	1,241,569
Brentwood WWTP (Atlantic Utilities)	Y	0.5	1,935,431	1,732,497	202,934	19,155
Broward Co. North Regional	N	80	N/A	N/A	N/A	N/A
Coral Springs	Y	5.5	33,019,093	12,985,015	20,034,078	1,891,075
East Port (Charlotte)	Y	5	30,741,187	11,985,954	18,755,233	1,770,361
East-Central Regional	Y	55	185,680,006	89,834,356	95,845,650	9,047,151
Encon	Y	18	80,342,900	35,153,349	45,189,551	4,265,574
Ft. Myers Beach	Y	7.92	43,404,725	17,638,715	25,766,010	2,432,129
Ft. Pierce Utility Authority	Y	9	47,772,174	19,638,192	28,133,982	2,655,649
G.T. Lohmeyer	Y	43	154,381,219	73,055,228	81,325,991	7,676,598
Gasparilla Island	Y	0.705	4,190,079	2,312,153	1,877,926	177,263
Manatee Co. SW	Y	18	80,342,900	35,153,349	45,189,551	4,265,574
Margate	Y	8	43,733,135	17,788,257	25,944,879	2,449,013
McKay Creek	Y	6	35,245,734	13,969,628	21,276,106	2,008,314
MDW&S North District Regional	Y	112.5	317,583,197	163,872,439	153,710,758	14,509,208
MDW&S South District	Y	97	284,165,876	144,685,848	139,480,028	13,165,928
Melbourne - Grant St.	Y	5.1	31,201,161	12,186,998	19,014,163	1,794,802
Miramar WWTP	Y	8.9	47,373,517	19,454,739	27,918,778	2,635,335
North Ft. Myers	Y	7.9	43,322,493	17,601,292	25,721,201	2,427,899
North Port (Charlotte)	Y	1.5	12,461,249	4,359,678	8,101,570	764,731
North Port St. Lucie	Y	1.5	12,461,249	4,359,678	8,101,570	764,731
Pahokee	N	1.2	N/A	N/A	N/A	N/A
Palm Bay (GDU-Port Malabar)	Y	4	26,003,878	9,937,295	16,066,583	1,516,572
Palm Beach Southern Regional	Y	30	117,851,215	53,990,786	63,860,429	6,027,973
Pembroke Pines (Century Village)	Y	7.69	42,455,883	17,207,427	25,248,457	2,383,276
Plantation (Broward Co.)	Y	30	117,851,215	53,990,786	63,860,429	6,027,973
Rockledge	Y	4.5	28,405,505	10,970,750	17,434,755	1,645,718
Royal Palm Beach	Y	6.34	36,733,310	14,631,632	22,101,678	2,086,242
Seacoast Utilities	Y	12	59,276,023	25,006,335	34,269,688	3,234,816
South Beaches	N	9	N/A	N/A	N/A	N/A
South Collier County	N	1	N/A	N/A	N/A	N/A
South Cross Bayou	Y	33	126,583,931	58,491,062	68,092,869	6,427,485
South Port St. Lucie	Y	2.2	16,607,725	6,014,131	10,593,594	999,960
St. Petersburg NE	N	16	N/A	N/A	N/A	N/A
St. Petersburg NW	N	20	N/A	N/A	N/A	N/A
St. Petersburg SW	N	20	N/A	N/A	N/A	N/A
Stuart	Y	4	26,003,878	9,937,295	16,066,583	1,516,572
Sunrise	N	8	N/A	N/A	N/A	N/A
Sykes Creek (Merritt Island)	N	6	N/A	N/A	N/A	N/A
West Melbourne	N	1.9	N/A	N/A	N/A	N/A
West Port (Charlotte)	Y	0.33	760,523	1,222,051	(461,528)	(43,565)
<b>Total (high end)</b>	<b>31</b>				<b>1,141,876,692</b>	<b>107,785,082</b>
<b>Total (low end)</b>					<b>285,469,173</b>	<b>26,946,270</b>
<b>Average cost per facility that must upgrade treatment</b>					<b>36,834,732</b>	<b>3,476,938</b>

**Appendix C-13**  
**Municipal Class I Facilities in Florida**  
**Capital Costs for Upgrading to Advanced Treatment (<10 mg/l BOD with Nutrient Removal)**  
**(Costs that Apply in Option 1)**

Facility	Apply?	Permitted Treatment Capacity (MGD)	Construction Costs for AT-II Plant with Nutrient Removal	Salvage Cost Associated with Existing Secondary Treatment	Cost for Upgrade from 2ndary to Advanced	Annualized Costs (At 7% cost of cap)
Albert Whitted	N	12.4	N/A	N/A	N/A	N/A
Belle Glade	Y	3	20,237,486	7,804,043	12,433,443	1,173,629
Brentwood WWTP (Atlantic Utilities)	Y	0.5	1,856,312	1,732,497	123,815	11,687
Broward Co. North Regional	N	80	N/A	N/A	N/A	N/A
Coral Springs	Y	5.5	33,469,325	12,985,015	20,484,310	1,933,574
East Port (Charlotte)	Y	5	30,923,670	11,985,954	18,937,716	1,787,586
East-Central Regional	Y	55	226,280,410	89,834,356	136,446,054	12,879,542
Encon	Y	18	89,541,034	35,153,349	54,387,685	5,133,813
Ft. Myers Beach	Y	7.92	45,298,918	17,638,715	27,660,202	2,610,927
Ft. Pierce Utility Authority	Y	9	50,369,450	19,638,192	30,731,258	2,900,813
G.T. Lohmeyer	Y	43	184,469,573	73,055,228	111,414,345	10,516,726
Gasparilla Island	Y	0.705	3,860,441	2,312,153	1,548,288	146,147
Manatee Co. SW	Y	18	89,541,034	35,153,349	54,387,685	5,133,813
Margate	Y	8	45,678,372	17,788,257	27,890,115	2,632,630
McKay Creek	Y	6	35,975,883	13,969,628	22,006,255	2,077,235
MDW&S North District Regional	Y	112.5	409,828,841	163,872,439	245,956,402	23,216,544
MDW&S South District	Y	97	362,381,872	144,685,848	217,696,023	20,548,965
Melbourne - Grant St.	Y	5.1	31,436,137	12,186,998	19,249,139	1,816,983
Miramar WWTP	Y	8.9	49,904,491	19,454,739	30,449,752	2,874,241
North Ft. Myers	Y	7.9	45,203,953	17,601,292	27,602,660	2,605,496
North Port (Charlotte)	Y	1.5	11,384,178	4,359,678	7,024,499	663,063
North Port St. Lucie	Y	1.5	11,384,178	4,359,678	7,024,499	663,063
Pahokee	N	1.2	N/A	N/A	N/A	N/A
Palm Bay (GDU-Port Malabar)	Y	4	25,695,420	9,937,295	15,758,125	1,487,455
Palm Beach Southern Regional	Y	30	136,822,199	53,990,786	82,831,413	7,818,699
Pembroke Pines (Century Village)	Y	7.69	44,204,327	17,207,427	26,996,901	2,548,316
Plantation (Broward Co.)	Y	30	136,822,199	53,990,786	82,831,413	7,818,699
Rockledge	Y	4.5	28,334,288	10,970,750	17,363,539	1,638,995
Royal Palm Beach	Y	6.34	37,659,973	14,631,632	23,028,341	2,173,712
Seacoast Utilities	Y	12	63,953,801	25,006,335	38,947,466	3,676,365
South Beaches	N	9	N/A	N/A	N/A	N/A
South Collier County	N	1	N/A	N/A	N/A	N/A
South Cross Bayou	Y	33	148,085,486	58,491,062	89,594,424	8,457,080
South Port St. Lucie	Y	2.2	15,644,322	6,014,131	9,630,192	909,022
St. Petersburg NE	N	16	N/A	N/A	N/A	N/A
St. Petersburg NW	N	20	N/A	N/A	N/A	N/A
St. Petersburg SW	N	20	N/A	N/A	N/A	N/A
Stuart	Y	4	25,695,420	9,937,295	15,758,125	1,487,455
Sunrise	N	8	N/A	N/A	N/A	N/A
Sykes Creek (Merritt Island)	N	6	N/A	N/A	N/A	N/A
West Melbourne	N	1.9	N/A	N/A	N/A	N/A
West Port (Charlotte)	Y	0.33	765,771	1,222,051	(456,280)	(43,070)
<b>Total (high end)</b>	<b>31</b>				<b>1,475,737,802</b>	<b>139,299,209</b>
<b>Total (low end)</b>					<b>368,934,450</b>	<b>34,824,802</b>
<b>Average cost per facility that must upgrade treatment</b>					<b>47,604,445</b>	<b>4,493,523</b>

**Appendix C-14**  
**Municipal Class I Facilities in Florida**  
**Incremental Annual O&M Costs for Upgrading to Advanced Treatment**  
**(Costs that Apply in Options 1 & 2)**

Facility	Apply?	Permitted Treatment Capacity (MGD)	O&M Costs for Advanced Treatment	O&M Costs for Secondary Treatment	Cost for Upgrade from 2ndary to AT-II
Albert Whitted	N	12.4	N/A	N/A	N/A
Belle Glade	Y	3	821,384	577,457	243,926
Brentwood WWTP (Atlantic Utilities)	Y	0.5	62,231	105,263	(43,032)
Broward Co. North Regional	N	80	N/A	N/A	N/A
Coral Springs	Y	5.5	1,966,137	1,027,068	939,068
East Port (Charlotte)	Y	5	1,713,990	938,159	775,831
East-Central Regional	Y	55	54,151,898	9,153,756	44,998,142
Encon	Y	18	10,841,361	3,167,843	7,673,518
Ft. Myers Beach	Y	7.92	3,323,959	1,452,258	1,871,701
Ft. Pierce Utility Authority	Y	9	3,995,771	1,639,778	2,355,993
G.T. Lohmeyer	Y	43	37,991,460	7,245,191	30,746,270
Gasparilla Island	Y	0.705	102,067	145,893	(43,826)
Manatee Co. SW	Y	18	10,841,361	3,167,843	7,673,518
Margate	Y	8	3,372,415	1,466,190	1,906,225
McKay Creek	Y	6	2,228,585	1,115,574	1,113,011
MDW&S North District Regional	Y	112.5	151,757,808	18,065,488	133,692,321
MDW&S South District	Y	97	122,586,518	15,692,348	106,894,170
Melbourne - Grant St.	Y	5.1	1,763,569	955,975	807,594
Miramar WWTP	Y	8.9	3,931,996	1,622,465	2,309,531
North Ft. Myers	Y	7.9	3,311,879	1,448,774	1,863,105
North Port (Charlotte)	Y	1.5	302,735	298,911	3,824
North Port St. Lucie	Y	1.5	302,735	298,911	3,824
Pahokee	N	1.2	N/A	N/A	N/A
Palm Bay (GDU-Port Malabar)	Y	4	1,242,962	758,948	484,014
Palm Beach Southern Regional	Y	30	22,622,782	5,146,595	17,476,188
Pembroke Pines (Century Village)	Y	7.69	3,185,850	1,412,163	1,773,687
Plantation (Broward Co.)	Y	30	22,622,782	5,146,595	17,476,188
Rockledge	Y	4.5	1,472,711	848,803	623,908
Royal Palm Beach	Y	6.34	2,412,681	1,175,546	1,237,135
Seacoast Utilities	Y	12	6,046,616	2,155,147	3,891,469
South Beaches	N	9	N/A	N/A	N/A
South Collier County	N	1	N/A	N/A	N/A
South Cross Bayou	Y	33	25,950,844	5,634,340	20,316,504
South Port St. Lucie	Y	2.2	525,509	430,087	95,422
St. Petersburg NE	N	16	N/A	N/A	N/A
St. Petersburg NW	N	20	N/A	N/A	N/A
St. Petersburg SW	N	20	N/A	N/A	N/A
Stuart	Y	4	1,242,962	758,948	484,014
Sunrise	N	8	N/A	N/A	N/A
Sykes Creek (Merritt Island)	N	6	N/A	N/A	N/A
West Melbourne	N	1.9	N/A	N/A	N/A
West Port (Charlotte)	Y	0.33	34,210	70,932	(36,722)
<b>Total (high end)</b>	<b>31</b>				<b>409,606,524</b>
<b>Total (low end)</b>					<b>106,497,696</b>
<b>Average cost per facility that must upgrade treatment</b>					<b>13,213,114</b>



**Appendix C-15**  
**Municipal Class I Facilities in Florida**  
**Capital Costs for Upgrading to High-Level Disinfection**  
**(Costs that Apply in Options 1 & 2)**

<b>Facilities</b>	<b>Apply?</b>	<b>Permitted Treatment Capacity (MGD)</b>	<b>Capital Costs for Secondary Treatment</b>	<b>Capital Costs for Secondary, Filters, High-Level Dis.</b>	<b>Incremental Difference</b>	<b>Capital Costs for Dechlorination (\$99)</b>	<b>Total Capital Costs</b>	<b>Annualized Costs (At 7% cost of cap)</b>
Albert Whitted	N	12.4	N/A	N/A	N/A	N/A	N/A	N/A
Belle Glade	N	3	N/A	N/A	N/A	N/A	N/A	N/A
Brentwood WWTP (Atlantic Utilities)	Y	0.5	3,810,184	4,904,659	1,094,475	23,222	1,117,698	105,503
Broward Co. North Regional	N	80	N/A	N/A	N/A	N/A	N/A	N/A
Coral Springs	Y	5.5	19,133,887	24,630,097	5,496,209	104,250	5,600,459	528,644
East Port (Charlotte)	Y	5	17,945,102	23,099,833	5,154,731	96,872	5,251,602	495,714
East-Central Regional	N	55	N/A	N/A	N/A	N/A	N/A	N/A
Encon	N	18	N/A	N/A	N/A	N/A	N/A	N/A
Ft. Myers Beach	N	7.92	N/A	N/A	N/A	N/A	N/A	N/A
Ft. Pierce Utility Authority	Y	9	26,652,892	34,308,935	7,656,043	147,324	7,803,367	736,583
G.T. Lohmeyer	Y	43	76,359,556	98,293,839	21,934,282	349,623	22,283,905	2,103,443
Gasparilla Island	N	0.705	N/A	N/A	N/A	N/A	N/A	N/A
Manatee Co. SW	N	18	N/A	N/A	N/A	N/A	N/A	N/A
Margate	Y	8	24,621,737	31,694,331	7,072,594	136,548	7,209,142	680,492
McKay Creek	Y	6	20,287,798	26,115,468	5,827,670	111,322	5,938,992	560,599
MDW&S North District Regional	Y	112.5	145,869,593	187,770,634	38,133,914	0	38,133,914	3,599,572
MDW&S South District	Y	97	132,019,019	169,941,482	34,422,388	0	34,422,388	3,249,230
Melbourne - Grant St.	N	5.1	N/A	N/A	N/A	N/A	N/A	N/A
Miramar WWTP	Y	8.9	26,453,223	34,051,912	7,598,688	146,302	7,744,990	731,072
North Ft. Myers	N	7.9	N/A	N/A	N/A	N/A	N/A	N/A
North Port (Charlotte)	N	1.5	N/A	N/A	N/A	N/A	N/A	N/A
North Port St. Lucie	N	1.5	N/A	N/A	N/A	N/A	N/A	N/A
Pahokee	Y	1.2	6,867,965	8,840,789	1,972,823	43,502	2,016,325	190,327
Palm Bay (GDU-Port Malabar)	N	4	N/A	N/A	N/A	N/A	N/A	N/A
Palm Beach	N	30	N/A	N/A	N/A	N/A	N/A	N/A
Pembroke Pines (Century Village)	Y	7.69	23,975,493	30,862,454	6,886,960	132,958	7,019,919	662,631
Plantation (Broward Co.)	N	30	N/A	N/A	N/A	N/A	N/A	N/A
Rockledge	Y	4.5	16,716,723	21,518,602	4,038,690	0	4,038,690	381,224
Royal Palm Beach	Y	6.34	21,054,513	27,102,422	5,143,271	0	5,143,271	485,488
Seacoast Utilities	Y	12	32,346,560	41,638,110	8,050,147	0	8,050,147	759,877
South Beaches	N	9	N/A	N/A	N/A	N/A	N/A	N/A
South Collier County	N	1	N/A	N/A	N/A	N/A	N/A	N/A
South Cross Bayou	N	33	N/A	N/A	N/A	N/A	N/A	N/A
South Port St. Lucie	N	2.2	N/A	N/A	N/A	N/A	N/A	N/A
St. Petersburg NE	N	16	N/A	N/A	N/A	N/A	N/A	N/A
St. Petersburg NW	N	20	N/A	N/A	N/A	N/A	N/A	N/A
St. Petersburg SW	N	20	N/A	N/A	N/A	N/A	N/A	N/A
Stuart	Y	4	15,442,780	19,878,719	4,435,939	81,198	4,517,136	426,386
Sunrise	Y	8	24,621,737	31,694,331	6,057,348	0	6,057,348	571,771
Sykes Creek (Merritt Island)	N	6	N/A	N/A	N/A	N/A	N/A	N/A
West Melbourne	Y	1.9	9,357,079	12,044,900	2,687,821	49,530	2,737,351	258,387
West Port (Charlotte)	Y	0.33	2,880,706	3,708,189	827,483	16,146	843,629	79,633
<b>Total (high end)</b>	<b>19</b>						<b>175,930,272</b>	<b>16,606,573</b>
<b>Total (low end)</b>							<b>43,982,568</b>	<b>4,151,643</b>
<b>Average cost per facility that must upgrade treatment</b>							<b>9,259,488</b>	<b>874,030</b>

*Note: Facilities denoted with " - " in the Capital Costs for Dechlorination column have some form of basic disinfection in place and are therefore assumed to already have dechlorination capacity.*

**Appendix C-16**  
**Municipal Class I Facilities in Florida**  
**Incremental Annual O&M Costs for Upgrading to High-Level Disinfection**  
**(Costs that Apply in Options 1 & 2)**

<b>Facilities</b>	<b>Apply?</b>	<b>Permitted Treatment Capacity (MGD)</b>	<b>O&amp;M Costs for Secondary</b>	<b>Total O&amp;M Costs for Secondary, Filters, High-Level</b>	<b>Total Incremental O&amp;M Costs</b>
				N /	
Albert Whitted	N	12.4	N/A	N/A	N/A
Belle Glade	N	3	N/A	N/A	N/A
Brentwood WWTP (Atlantic Utilities)	Y	0.5	105,263	141,398	36,135
Broward Co. North Regional	N	80	N/A	N/A	N/A
Coral Springs	Y	5.5	1,027,068	1,379,640	352,572
East Port (Charlotte)	Y	5	938,159	1,260,210	322,051
East-Central Regional	N	55	N/A	N/A	N/A
Encon	N	18	N/A	N/A	N/A
Ft. Myers Beach	N	7.92	N/A	N/A	N/A
Ft. Pierce Utility Authority	Y	9	1,639,778	2,202,682	562,903
G.T. Lohmeyer	Y	43	7,245,191	9,732,320	2,487,129
Gasparilla Island	N	0.705	N/A	N/A	N/A
Manatee Co. SW	N	18	N/A	N/A	N/A
Margate	Y	8	1,466,190	1,969,504	503,314
McKay Creek	Y	6	1,115,574	1,498,529	382,954
MDW&S North District Regional	Y	112.5	18,065,488	24,267,008	6,201,521
MDW&S South District	Y	97	15,692,348	21,079,218	5,386,869
Melbourne - Grant St.	N	5.1	N/A	N/A	N/A
Miramar WWTP	Y	8.9	1,622,465	2,179,425	556,960
North Ft. Myers	N	7.9	N/A	N/A	N/A
North Port (Charlotte)	N	1.5	N/A	N/A	N/A
North Port St. Lucie	N	1.5	N/A	N/A	N/A
Pahokee	Y	1.2	27,845	37,404	9,559
Palm Bay (GDU-Port Malabar)	N	4	N/A	N/A	N/A
Palm Beach Southern Regional	N	30	N/A	N/A	N/A
Pembroke Pines (Century Village)	Y	7.69	1,412,163	1,896,930	484,767
Plantation (Broward Co.)	N	30	N/A	N/A	N/A
Rockledge	Y	4.5	848,803	1,140,179	291,377
Royal Palm Beach	Y	6.34	1,175,546	1,579,087	403,541
Seacoast Utilities	Y	12	2,155,147	2,894,966	739,819
South Beaches	N	9	N/A	N/A	N/A
South Collier County	N	1	N/A	N/A	N/A
South Cross Bayou	N	33	N/A	N/A	N/A
South Port St. Lucie	N	2.2	N/A	N/A	N/A
St. Petersburg NE	N	16	N/A	N/A	N/A
St. Petersburg NW	N	20	N/A	N/A	N/A
St. Petersburg SW	N	20	N/A	N/A	N/A
Stuart	Y	4	758,948	1,019,479	260,532
Sunrise	Y	8	168,834	226,791	57,957
Sykes Creek (Merritt Island)	N	6	N/A	N/A	N/A
West Melbourne	Y	1.9	43,086	57,877	14,791
West Port (Charlotte)	Y	0.33	70,932	95,282	24,350
<b>Total (high end)</b>	<b>19</b>				<b>19,079,100</b>
<b>Total (low end)</b>					<b>4,769,775</b>
<b>Average cost per facility that must upgrade treatment</b>					<b>1,004,163</b>

**Appendix C-17**  
**Municipal Class I Facilities in Florida**  
**Costs for New Monitoring Wells**  
**(Costs that Apply in Options 1 & 2)**

<b>Facility</b>	<b>Apply?</b>	<b>Number Injection Wells</b>	<b>Number New Monitoring Wells Needed</b>	<b>Cost per Monitoring Well</b>	<b>Total Cost for Additional Wells</b>	<b>Annualized Costs (At 7% cost of cap)</b>
<i>Albert Whitted</i>	Y	2	2	250,000	500,000	47,196
<i>Belle Glade</i>	Y	1	1	250,000	250,000	23,598
<i>Brentwood WWTP (Atlantic Utilities)</i>	Y	1	1	250,000	250,000	23,598
<i>Broward Co. North Regional</i>	Y	6	6	250,000	1,500,000	141,589
<i>Coral Springs</i>	Y	2	2	250,000	500,000	47,196
<i>East Port (Charlotte)</i>	Y	1	1	250,000	250,000	23,598
<i>East-Central Regional</i>	Y	6	6	250,000	1,500,000	141,589
<i>Encon</i>	Y	1	1	250,000	250,000	23,598
<i>Ft. Myers Beach</i>	Y	1	1	250,000	250,000	23,598
<i>Ft. Pierce Utility Authority</i>	Y	1	1	250,000	250,000	23,598
<i>G.T. Lohmeyer</i>	Y	5	5	250,000	1,250,000	117,991
<i>Gasparilla Island</i>	Y	1	1	250,000	250,000	23,598
<i>Manatee Co. SW</i>	Y	1	1	250,000	250,000	23,598
<i>Margate</i>	Y	2	2	250,000	500,000	47,196
<i>McKay Creek</i>	Y	2	2	250,000	500,000	47,196
<i>MDW&amp;S North District Regional</i>	Y	4	4	250,000	1,000,000	94,393
<i>MDW&amp;S South District</i>	Y	17	17	250,000	4,250,000	401,170
<i>Melbourne - Grant St.</i>	Y	1	1	250,000	250,000	23,598
<i>Miramar WWTP</i>	Y	2	2	250,000	500,000	47,196
<i>North Ft. Myers</i>	Y	1	1	250,000	250,000	23,598
<i>North Port (Charlotte)</i>	Y	1	1	250,000	250,000	23,598
<i>North Port St. Lucie</i>	Y	1	1	250,000	250,000	23,598
<i>Pahokee</i>	Y	1	1	250,000	250,000	23,598
<i>Palm Bay (GDU-Port Malabar)</i>	Y	1	1	250,000	250,000	23,598
<i>Palm Beach Southern Regional</i>	Y	2	2	250,000	500,000	47,196
<i>Pembroke Pines (Century Village)</i>	Y	2	2	250,000	500,000	47,196
<i>Plantation (Broward Co.)</i>	Y	2	2	250,000	500,000	47,196
<i>Rockledge</i>	Y	1	1	250,000	250,000	23,598
<i>Royal Palm Beach</i>	Y	1	1	250,000	250,000	23,598
<i>Seacoast Utilities</i>	Y	1	1	250,000	250,000	23,598
<i>South Beaches</i>	Y	1	1	250,000	250,000	23,598
<i>South Collier County</i>	Y	1	1	250,000	250,000	23,598
<i>South Cross Bayou</i>	Y	3	3	250,000	750,000	70,795
<i>South Port St. Lucie</i>	Y	1	1	250,000	250,000	23,598
<i>St. Petersburg NE</i>	Y	3	3	250,000	750,000	70,795
<i>St. Petersburg NW</i>	Y	2	2	250,000	500,000	47,196
<i>St. Petersburg SW</i>	Y	3	3	250,000	750,000	70,795
<i>Stuart</i>	Y	2	2	250,000	500,000	47,196
<i>Sunrise</i>	Y	3	3	250,000	750,000	70,795
<i>Sykes Creek (Merritt Island)</i>	Y	2	2	250,000	500,000	47,196
<i>West Melbourne</i>	Y	1	1	250,000	250,000	23,598
<i>West Port (Charlotte)</i>	Y	1	1	250,000	250,000	23,598
<b>Total (high end)</b>	<b>42</b>				<b>23,500,000</b>	<b>2,218,234</b>
<b>Total (low end)</b>					<b>5,875,000</b>	<b>554,558</b>
<b>Average Cost per Facility</b>					<b>559,524</b>	<b>52,815</b>

Appendix C-18 Municipal Class I Facilities in Florida - Incremental Monitoring Costs- (Costs that Apply in Options 1 & 2)																
Facility	Apply?	Number of Additional Monitoring Points	Sample Frequency	Avg. No. Of Samples	Avg. Hrs to Collect Sample	Sampling Burden	Sampling Cost	Microbial Analysis Cost	Microbial Analysis Frequency	Number of Microbial Analyses	NPDWS Analysis Cost	NPDWS Analysis Frequency	Number NPDWS Analyses	Total Analysis Cost	Reporting Cost	Estimate of Monitoring Costs
Albert Whitted	Y	2	4	8	1	8	292.86	340.00	1	2	2177.00	4	8	18096.00	274.56	18,663
Belle Glade	Y	1	4	4	1	4	146.43	340.00	1	1	2177.00	4	4	9048.00	137.28	9,332
Brentwood WWTP (Atlantic Utilities)	Y	1	4	4	1	4	146.43	340.00	1	1	2177.00	4	4	9048.00	137.28	9,332
Broward Co. North Regional	Y	6	4	24	1	24	878.59	340.00	1	6	2177.00	4	24	54288.00	823.68	55,990
Coral Springs	Y	2	4	8	1	8	292.86	340.00	1	2	2177.00	4	8	18096.00	274.56	18,663
East Port (Charlotte)	Y	1	4	4	1	4	146.43	340.00	1	1	2177.00	4	4	9048.00	137.28	9,332
East-Central Regional	Y	6	4	24	1	24	878.59	340.00	1	6	2177.00	4	24	54288.00	823.68	55,990
Encon	Y	1	4	4	1	4	146.43	340.00	1	1	2177.00	4	4	9048.00	137.28	9,332
Ft. Myers Beach	Y	1	4	4	1	4	146.43	340.00	1	1	2177.00	4	4	9048.00	137.28	9,332
Ft. Pierce Utility Authority	Y	1	4	4	1	4	146.43	340.00	1	1	2177.00	4	4	9048.00	137.28	9,332
G.T. Lohmeyer	Y	5	4	20	1	20	732.16	340.00	1	5	2177.00	4	20	45240.00	686.40	46,659
Gasparilla Island	Y	1	4	4	1	4	146.43	340.00	1	1	2177.00	4	4	9048.00	137.28	9,332
Manatee Co. SW	Y	1	4	4	1	4	146.43	340.00	1	1	2177.00	4	4	9048.00	137.28	9,332
Margate	Y	2	4	8	1	8	292.86	340.00	1	2	2177.00	4	8	18096.00	274.56	18,663
McKay Creek	Y	2	4	8	1	8	292.86	340.00	1	2	2177.00	4	8	18096.00	274.56	18,663
MDW&S North District Regional	Y	4	4	16	1	16	585.73	340.00	1	4	2177.00	4	16	36192.00	549.12	37,327
MDW&S South District	Y	17	4	68	1	68	2489.34	340.00	1	17	2177.00	4	68	153816.00	2333.76	158,639
Melbourne - Grant St.	Y	1	4	4	1	4	146.43	340.00	1	1	2177.00	4	4	9048.00	137.28	9,332
Miramar WWTP	Y	2	4	8	1	8	292.86	340.00	1	2	2177.00	4	8	18096.00	274.56	18,663
North Ft. Myers	Y	1	4	4	1	4	146.43	340.00	1	1	2177.00	4	4	9048.00	137.28	9,332
North Port (Charlotte)	Y	1	4	4	1	4	146.43	340.00	1	1	2177.00	4	4	9048.00	137.28	9,332
North Port St. Lucie	Y	1	4	4	1	4	146.43	340.00	1	1	2177.00	4	4	9048.00	137.28	9,332
Pahokee	Y	1	4	4	1	4	146.43	340.00	1	1	2177.00	4	4	9048.00	137.28	9,332
Palm Bay (GDU-Port Malabar)	Y	1	4	4	1	4	146.43	340.00	1	1	2177.00	4	4	9048.00	137.28	9,332
Palm Beach Southern Regional	Y	2	4	8	1	8	292.86	340.00	1	2	2177.00	4	8	18096.00	274.56	18,663
Pembroke Pines (Century Village)	Y	2	4	8	1	8	292.86	340.00	1	2	2177.00	4	8	18096.00	274.56	18,663
Plantation (Broward Co.)	Y	2	4	8	1	8	292.86	340.00	1	2	2177.00	4	8	18096.00	274.56	18,663
Rockledge	Y	1	4	4	1	4	146.43	340.00	1	1	2177.00	4	4	9048.00	137.28	9,332
Royal Palm Beach	Y	1	4	4	1	4	146.43	340.00	1	1	2177.00	4	4	9048.00	137.28	9,332
Seacoast Utilities	Y	1	4	4	1	4	146.43	340.00	1	1	2177.00	4	4	9048.00	137.28	9,332
South Beaches	Y	1	4	4	1	4	146.43	340.00	1	1	2177.00	4	4	9048.00	137.28	9,332
South Collier County	Y	1	4	4	1	4	146.43	340.00	1	1	2177.00	4	4	9048.00	137.28	9,332
South Cross Bayou	Y	3	4	12	1	12	439.30	340.00	1	3	2177.00	4	12	27144.00	411.84	27,995
South Port St. Lucie	Y	1	4	4	1	4	146.43	340.00	1	1	2177.00	4	4	9048.00	137.28	9,332
St. Petersburg NE	Y	3	4	12	1	12	439.30	340.00	1	3	2177.00	4	12	27144.00	411.84	27,995
St. Petersburg NW	Y	2	4	8	1	8	292.86	340.00	1	2	2177.00	4	8	18096.00	274.56	18,663
St. Petersburg SW	Y	3	4	12	1	12	439.30	340.00	1	3	2177.00	4	12	27144.00	411.84	27,995
Stuart	Y	2	4	8	1	8	292.86	340.00	1	2	2177.00	4	8	18096.00	274.56	18,663
Sunrise	Y	3	4	12	1	12	439.30	340.00	1	3	2177.00	4	12	27144.00	411.84	27,995
Sykes Creek (Merritt Island)	Y	2	4	8	1	8	292.86	340.00	1	2	2177.00	4	8	18096.00	274.56	18,663
West Melbourne	Y	1	4	4	1	4	146.43	340.00	1	1	2177.00	4	4	9048.00	137.28	9,332
West Port (Charlotte)	Y	1	4	4	1	4	146.43	340.00	1	1	2177.00	4	4	9048.00	137.28	9,332
Total (high end)	42	94														877,181
Total (low end)																219,295
Average Cost per Facility																20,885

**Appendix C-19**  
**Municipal Class I Facilities in Florida**  
**Incremental Demonstration Costs (10-24 mg/l BOD w/o Nutrient Removal)**  
**(Costs that Apply in Option 1)**

<b>Facility</b>	<b>Apply?</b>	<b>Permitted Treatment Capacity (MGD)</b>	<b>Estimate of Demonstration Cost</b>	<b>Annualized Costs (At 7% cost of cap)</b>
Albert Whitted	Y	12.4	238,535	22,516
Belle Glade	Y	3	238,535	22,516
Brentwood WWTP (Atlantic Utilities)	Y	0.5	238,535	22,516
Broward Co. North Regional	Y	80	238,535	22,516
Coral Springs	Y	5.5	238,535	22,516
East Port (Charlotte)	Y	5	238,535	22,516
East-Central Regional	Y	55	238,535	22,516
Encon	Y	18	238,535	22,516
Ft. Myers Beach	Y	7.92	238,535	22,516
Ft. Pierce Utility Authority	Y	9	238,535	22,516
G.T. Lohmeyer	Y	43	238,535	22,516
Gasparilla Island	Y	0.705	238,535	22,516
Manatee Co. SW	Y	18	238,535	22,516
Margate	Y	8	238,535	22,516
McKay Creek	Y	6	238,535	22,516
MDW&S North District Regional	Y	112.5	238,535	22,516
MDW&S South District	Y	97	238,535	22,516
Melbourne - Grant St.	Y	5.1	238,535	22,516
Miramar WWTP	Y	8.9	238,535	22,516
North Ft. Myers	Y	7.9	238,535	22,516
North Port (Charlotte)	Y	1.5	238,535	22,516
North Port St. Lucie	Y	1.5	238,535	22,516
Pahokee	Y	1.2	238,535	22,516
Palm Bay (GDU-Port Malabar)	Y	4	238,535	22,516
Palm Beach Southern	Y	30	238,535	22,516
Pembroke Pines (Century Village)	Y	7.69	238,535	22,516
Plantation (Broward Co.)	Y	30	238,535	22,516
Rockledge	Y	4.5	238,535	22,516
Royal Palm Beach	Y	6.34	238,535	22,516
Seacoast Utilities	Y	12	238,535	22,516
South Beaches	Y	9	238,535	22,516
South Collier County	Y	1	238,535	22,516
South Cross Bayou	Y	33	238,535	22,516
South Port St. Lucie	Y	2.2	238,535	22,516
St. Petersburg NE	Y	16	238,535	22,516
St. Petersburg NW	Y	20	238,535	22,516
St. Petersburg SW	Y	20	238,535	22,516
Stuart	Y	4	238,535	22,516
Sunrise	Y	8	238,535	22,516
Sykes Creek (Merritt Island)	Y	6	238,535	22,516
West Melbourne	Y	1.9	238,535	22,516
West Port (Charlotte)	Y	0.33	238,535	22,516
<b>Total (high end)</b>	<b>42</b>		<b>10,018,478</b>	<b>945,673</b>
<b>Total (low end)</b>			<b>2,504,620</b>	<b>236,418</b>
<b>Average Cost per Facility</b>			<b>238,535</b>	<b>22,516</b>

<b>Appendix C-20</b> <b>Municipal Class I Facilities in Florida</b> <b>Incremental Demonstration Costs (10-24 mg/l BOD with Nutrient Removal)</b> <b>(Costs that Apply in Option 1)</b>				
<b>Facility</b>	<b>Apply?</b>	<b>Permitted Treatment Capacity (MGD)</b>	<b>Estimate of Demonstration Cost</b>	<b>Annualized Costs (At 7% cost of cap)</b>
Albert Whitted	Y	12.4	178,901	16,887
Belle Glade	Y	3	178,901	16,887
Brentwood WWTP (Atlantic Utilities)	Y	0.5	178,901	16,887
Broward Co. North Regional	Y	80	178,901	16,887
Coral Springs	Y	5.5	178,901	16,887
East Port (Charlotte)	Y	5	178,901	16,887
East-Central Regional	Y	55	178,901	16,887
Encon	Y	18	178,901	16,887
Ft. Myers Beach	Y	7.92	178,901	16,887
Ft. Pierce Utility Authority	Y	9	178,901	16,887
G.T. Lohmeyer	Y	43	178,901	16,887
Gasparilla Island	Y	0.705	178,901	16,887
Manatee Co. SW	Y	18	178,901	16,887
Margate	Y	8	178,901	16,887
McKay Creek	Y	6	178,901	16,887
MDW&S North District Regional	Y	112.5	178,901	16,887
MDW&S South District	Y	97	178,901	16,887
Melbourne - Grant St.	Y	5.1	178,901	16,887
Miramar WWTP	Y	8.9	178,901	16,887
North Ft. Myers	Y	7.9	178,901	16,887
North Port (Charlotte)	Y	1.5	178,901	16,887
North Port St. Lucie	Y	1.5	178,901	16,887
Pahokee	Y	1.2	178,901	16,887
Palm Bay (GDU-Port Malabar)	Y	4	178,901	16,887
Palm Beach Southern	Y	30	178,901	16,887
Pembroke Pines (Century Village)	Y	7.69	178,901	16,887
Plantation (Broward Co.)	Y	30	178,901	16,887
Rockledge	Y	4.5	178,901	16,887
Royal Palm Beach	Y	6.34	178,901	16,887
Seacoast Utilities	Y	12	178,901	16,887
South Beaches	Y	9	178,901	16,887
South Collier County	Y	1	178,901	16,887
South Cross Bayou	Y	33	178,901	16,887
South Port St. Lucie	Y	2.2	178,901	16,887
St. Petersburg NE	Y	16	178,901	16,887
St. Petersburg NW	Y	20	178,901	16,887
St. Petersburg SW	Y	20	178,901	16,887
Stuart	Y	4	178,901	16,887
Sunrise	Y	8	178,901	16,887
Sykes Creek (Merritt Island)	Y	6	178,901	16,887
West Melbourne	Y	1.9	178,901	16,887
West Port (Charlotte)	Y	0.33	178,901	16,887
<b>Total (high end)</b>	<b>42</b>		<b>7,513,859</b>	<b>709,255</b>
<b>Total (low end)</b>			<b>1,878,465</b>	<b>177,314</b>
<b>Average Cost per Facility</b>			<b>178,901</b>	<b>16,887</b>

**Appendix C-21**  
**Municipal Class I Facilities in Florida**  
**Incremental Demonstration Costs (<10 mg/l BOD w/o Nutrient**  
**Removal)**  
**(Costs that Apply in Option 1)**

<b>Facility</b>	<b>Apply?</b>	<b>Permitted Treatment Capacity (MGD)</b>	<b>1,996 Estimate of Demonstration Cost</b>	<b>Annualized Costs (At 7% cost of cap)</b>
Albert Whitted	Y	12.4	119,268	11,258
Belle Glade	Y	3	119,268	11,258
Brentwood WWTP (Atlantic Utilities)	Y	0.5	119,268	11,258
Broward Co. North Regional	Y	80	119,268	11,258
Coral Springs	Y	5.5	119,268	11,258
East Port (Charlotte)	Y	5	119,268	11,258
East-Central Regional	Y	55	119,268	11,258
Encon	Y	18	119,268	11,258
Ft. Myers Beach	Y	7.92	119,268	11,258
Ft. Pierce Utility Authority	Y	9	119,268	11,258
G. T. Lohmeyer	Y	43	119,268	11,258
Gasparilla Island	Y	0.705	119,268	11,258
Manatee Co. SW	Y	18	119,268	11,258
Margate	Y	8	119,268	11,258
McKay Creek	Y	6	119,268	11,258
MDW&S North District Regional	Y	112.5	119,268	11,258
MDW&S South District	Y	97	119,268	11,258
Melbourne - Grant St.	Y	5.1	119,268	11,258
Miramar WWTP	Y	8.9	119,268	11,258
North Ft. Myers	Y	7.9	119,268	11,258
North Port (Charlotte)	Y	1.5	119,268	11,258
North Port St. Lucie	Y	1.5	119,268	11,258
Pahokee	Y	1.2	119,268	11,258
Palm Bay (GDU-Port Malabar)	Y	4	119,268	11,258
Palm Beach Southern Regional	Y	30	119,268	11,258
Pembroke Pines (Century Village)	Y	7.69	119,268	11,258
Plantation (Broward Co.)	Y	30	119,268	11,258
Rockledge	Y	4.5	119,268	11,258
Royal Palm Beach	Y	6.34	119,268	11,258
Seacoast Utilities	Y	12	119,268	11,258
South Beaches	Y	9	119,268	11,258
South Collier County	Y	1	119,268	11,258
South Cross Bayou	Y	33	119,268	11,258
South Port St. Lucie	Y	2.2	119,268	11,258
St. Petersburg NE	Y	16	119,268	11,258
St. Petersburg NW	Y	20	119,268	11,258
St. Petersburg SW	Y	20	119,268	11,258
Stuart	Y	4	119,268	11,258
Sunrise	Y	8	119,268	11,258
Sykes Creek (Merritt Island)	Y	6	119,268	11,258
West Melbourne	Y	1.9	119,268	11,258
West Port (Charlotte)	Y	0.33	119,268	11,258
<b>Total (high end)</b>	<b>42</b>		<b>5,009,239</b>	<b>472,837</b>
<b>Total (low end)</b>			<b>1,252,310</b>	<b>118,209</b>
<b>Average Cost per Facility</b>			<b>119,268</b>	<b>11,258</b>



**Appendix C-22**  
**Municipal Class I Facilities in Florida**  
**Incremental Demonstration Costs (<10 mg/l BOD with Nutrient Removal)**  
**(Costs that Apply in Option 1)**

<b>Facility</b>	<b>Apply?</b>	<b>Permitted Treatment Capacity (MGD)</b>	<b>Estimate of Demonstration Cost</b>	<b>Annualized Costs (At 7% cost of cap)</b>
Albert Whitted	Y	12.4	59,634	5,629
Belle Glade	Y	3	59,634	5,629
Brentwood WWTP (Atlantic Utilities)	Y	0.5	59,634	5,629
Broward Co. North Regional	Y	80	59,634	5,629
Coral Springs	Y	5.5	59,634	5,629
East Port (Charlotte)	Y	5	59,634	5,629
East-Central Regional	Y	55	59,634	5,629
Encon	Y	18	59,634	5,629
Ft. Myers Beach	Y	7.92	59,634	5,629
Ft. Pierce Utility Authority	Y	9	59,634	5,629
G.T. Lohmeyer	Y	43	59,634	5,629
Gasparilla Island	Y	0.705	59,634	5,629
Manatee Co. SW	Y	18	59,634	5,629
Margate	Y	8	59,634	5,629
McKay Creek	Y	6	59,634	5,629
MDW&S North District Regional	Y	112.5	59,634	5,629
MDW&S South District	Y	97	59,634	5,629
Melbourne - Grant St.	Y	5.1	59,634	5,629
Miramar WWTP	Y	8.9	59,634	5,629
North Ft. Myers	Y	7.9	59,634	5,629
North Port (Charlotte)	Y	1.5	59,634	5,629
North Port St. Lucie	Y	1.5	59,634	5,629
Pahokee	Y	1.2	59,634	5,629
Palm Bay (GDU-Port Malabar)	Y	4	59,634	5,629
Palm Beach Southern Regional	Y	30	59,634	5,629
Pembroke Pines (Century Village)	Y	7.69	59,634	5,629
Plantation (Broward Co.)	Y	30	59,634	5,629
Rockledge	Y	4.5	59,634	5,629
Royal Palm Beach	Y	6.34	59,634	5,629
Seacoast Utilities	Y	12	59,634	5,629
South Beaches	Y	9	59,634	5,629
South Collier County	Y	1	59,634	5,629
South Cross Bayou	Y	33	59,634	5,629
South Port St. Lucie	Y	2.2	59,634	5,629
St. Petersburg NE	Y	16	59,634	5,629
St. Petersburg NW	Y	20	59,634	5,629
St. Petersburg SW	Y	20	59,634	5,629
Stuart	Y	4	59,634	5,629
Sunrise	Y	8	59,634	5,629
Sykes Creek (Merritt Island)	Y	6	59,634	5,629
West Melbourne	Y	1.9	59,634	5,629
West Port (Charlotte)	Y	0.33	59,634	5,629
<b>Total (high end)</b>	<b>42</b>		<b>2,504,620</b>	<b>236,418</b>
<b>Total (low end)</b>			<b>626,155</b>	<b>59,105</b>
<b>Average Cost per Facility</b>			<b>59,634</b>	<b>5,629</b>

**Appendix C-23**  
**Municipal Class I Facilities in Florida**  
**Incremental Demonstration Costs**  
**(Costs that Apply in Option 2)**

<b>Facility</b>	<b>Apply?</b>	<b>Permitted Treatment Capacity (MGD)</b>	<b>Estimate of Demonstration Cost (\$99)</b>	<b>Annualized Costs (At 7% cost of cap)</b>
Albert Whitted	Y	12.4	596,338	56,290
Belle Glade	Y	3	596,338	56,290
Brentwood WWTP (Atlantic Utilities)	Y	0.5	596,338	56,290
Broward Co. North Regional	Y	80	596,338	56,290
Coral Springs	Y	5.5	596,338	56,290
East Port (Charlotte)	Y	5	596,338	56,290
East-Central Regional	Y	55	596,338	56,290
Encon	Y	18	596,338	56,290
Ft. Myers Beach	Y	7.92	596,338	56,290
Ft. Pierce Utility Authority	Y	9	596,338	56,290
G. T. Lohmeyer	Y	43	596,338	56,290
Gasparilla Island	Y	0.705	596,338	56,290
Manatee Co. SW	Y	18	596,338	56,290
Margate	Y	8	596,338	56,290
McKay Creek	Y	6	596,338	56,290
MDW&S North District Regional	Y	112.5	596,338	56,290
MDW&S South District	Y	97	596,338	56,290
Melbourne - Grant St.	Y	5.1	596,338	56,290
Miramar WWTP	Y	8.9	596,338	56,290
North Ft. Myers	Y	7.9	596,338	56,290
North Port (Charlotte)	Y	1.5	596,338	56,290
North Port St. Lucie	Y	1.5	596,338	56,290
Pahokee	Y	1.2	596,338	56,290
Palm Bay (GDU-Port Malabar)	Y	4	596,338	56,290
Palm Beach Southern Regional	Y	30	596,338	56,290
Pembroke Pines (Century Village)	Y	7.69	596,338	56,290
Plantation (Broward Co.)	Y	30	596,338	56,290
Rockledge	Y	4.5	596,338	56,290
Royal Palm Beach	Y	6.34	596,338	56,290
Seacoast Utilities	Y	12	596,338	56,290
South Beaches	Y	9	596,338	56,290
South Collier County	Y	1	596,338	56,290
South Cross Bayou	Y	33	596,338	56,290
South Port St. Lucie	Y	2.2	596,338	56,290
St. Petersburg NE	Y	16	596,338	56,290
St. Petersburg NW	Y	20	596,338	56,290
St. Petersburg SW	Y	20	596,338	56,290
Stuart	Y	4	596,338	56,290
Sunrise	Y	8	596,338	56,290
Sykes Creek (Merritt Island)	Y	6	596,338	56,290
West Melbourne	Y	1.9	596,338	56,290
West Port (Charlotte)	Y	0.33	596,338	56,290
<b>Total (high end)</b>	<b>42</b>			<b>2,364,184</b>
<b>Total (low end)</b>				<b>591,046</b>
<b>Average Cost per Facility</b>				<b>56,290</b>

## **Appendix D**

**Appendix D-1**  
**Municipal Class I Facilities in Florida**  
**"Baseline" Scenario - Estimated Cost per Household**

Facility	Population Served (see Notes)	Estimated Number of Households	For Cities that Must Upgrade to Advanced Treatment with Nitrogen & Phosphorus Removal		For Cities that Must Upgrade to RO		For Cities that Do Not Have to Upgrade Treatment	
			Annual Cost (= Annual Cap \$ + O&M \$)	Annual Cost per Household	Annual Cost (= Annual Cap \$ + O&M \$)	Annual Cost per Household	Annual Cost (= Annual Cap \$ + O&M \$)	Annual Cost per Household
Albert Whitted	124,000	54,148	N/A	N/A	11,503,539	212.44	N/A	N/A
Belle Glade	30,000	13,100	N/A	N/A	7,041,233	537.48	N/A	N/A
Brentwood WWTP (Atlantic Utilities)	5,000	2,183	2,055,672	941.50	N/A	N/A	N/A	N/A
Broward Co. North Regional	800,000	349,345	N/A	N/A	N/A	N/A	2,171,280	6.22
Coral Springs	55,000	24,017	5,410,399	225.27	N/A	N/A	N/A	N/A
East Port (Charlotte)	50,000	21,834	N/A	N/A	10,364,065	474.67	N/A	N/A
East-Central Regional	550,000	240,175	60,048,965	250.02	N/A	N/A	N/A	N/A
Encon	180,000	78,603	14,884,218	189.36	N/A	N/A	N/A	N/A
Ft. Myers Beach	79,200	34,585	N/A	N/A	12,484,768	360.99	N/A	N/A
Ft. Pierce Utility Authority	90,000	39,301	8,012,100	203.86	N/A	N/A	N/A	N/A
G.T. Lohmeyer	430,000	187,773	46,156,216	245.81	N/A	N/A	N/A	N/A
Gasparilla Island	7,050	3,079	N/A	N/A	3,389,459	1,100.97	N/A	N/A
Manatee Co. SW	180,000	78,603	N/A	N/A	27,208,136	346.15	N/A	N/A
Margate	80,000	34,934	7,246,655	207.44	N/A	N/A	N/A	N/A
McKay Creek	60,000	26,201	N/A	N/A	11,916,318	454.81	N/A	N/A
MDW&S North District Regional	1,125,000	491,266	159,042,388	323.74	N/A	N/A	N/A	N/A
MDW&S South District	970,000	423,581	129,822,079	306.49	N/A	N/A	N/A	N/A
Melbourne - Grant St.	51,000	22,271	N/A	N/A	9,972,594	447.79	N/A	N/A
Miramar WWTP	89,000	38,865	7,951,343	204.59	N/A	N/A	N/A	N/A
North Ft. Myers	79,000	34,498	N/A	N/A	12,491,785	362.10	N/A	N/A
North Port (Charlotte)	15,000	6,550	N/A	N/A	4,722,778	721.01	N/A	N/A
North Port St. Lucie	15,000	6,550	N/A	N/A	4,722,778	721.01	N/A	N/A
Pahokee	12,000	5,240	N/A	N/A	3,468,559	661.92	N/A	N/A
Palm Bay (GDU-Port Malabar)	40,000	17,467	N/A	N/A	8,517,316	487.62	N/A	N/A
Palm Beach Southern	300,000	131,004	27,390,653	209.08	N/A	N/A	N/A	N/A
Pembroke Pines (Century Village)	76,900	33,581	7,009,059	208.72	N/A	N/A	N/A	N/A
Plantation (Broward Co.)	300,000	131,004	27,390,653	209.08	N/A	N/A	N/A	N/A
Rockledge	45,000	19,651	N/A	N/A	8,329,910	423.90	N/A	N/A
Royal Palm Beach	63,400	27,686	N/A	N/A	11,298,428	408.10	N/A	N/A
Seacoast Utilities	120,000	52,402	N/A	N/A	19,511,398	372.34	N/A	N/A
South Beaches	90,000	39,301	N/A	N/A	N/A	N/A	2,076,887	52.85
South Collier County	10,000	4,367	N/A	N/A	3,563,455	816.03	N/A	N/A
South Cross Bayou	330,000	144,105	30,888,228	214.35	N/A	N/A	N/A	N/A
South Port St. Lucie	22,000	9,607	N/A	N/A	5,433,193	565.55	N/A	N/A
St. Petersburg NE	160,000	69,869	N/A	N/A	19,173,087	274.41	N/A	N/A
St. Petersburg NW	200,000	87,336	N/A	N/A	22,518,025	257.83	N/A	N/A
St. Petersburg SW	200,000	87,336	N/A	N/A	22,536,904	258.05	N/A	N/A
Stuart	40,000	17,467	4,350,961	249.09	N/A	N/A	N/A	N/A
Sunrise	80,000	34,934	N/A	N/A	11,682,235	334.40	N/A	N/A
Sykes Creek (Merritt Island)	60,000	26,201	N/A	N/A	9,573,982	365.41	N/A	N/A
West Melbourne	19,000	8,297	N/A	N/A	4,522,082	545.03	N/A	N/A
West Port (Charlotte)	3,300	1,441	N/A	N/A	2,698,836	1,872.83	N/A	N/A
<b>Total</b>		3,159,760	537,659,590		268,644,863		4,248,167	
<b>Grand Total (annual costs)</b>			<b>810,552,620</b>					

**Notes:**

1. These estimates reflect costs that might be incurred if facilities exhibit fluid movement.
2. Population data assume 100 gallons per person per day. These data reflect the population that is served by the discharge to the UIC well, not necessarily the entire population served by the WWTP (because most facilities have multiple disposal practices).
3. Number of Persons / Household = 2.29, From the 1990 Census.

**Appendix D-2**  
**Municipal Class I Facilities in Florida**  
**Regulatory Options**  
**Estimated Cost per Household**

Facility	Population Served (see Notes)	Estimated Number of Households	For Cities Must Upgrade Treatment		For Cities with Advanced Treatment Already in Place	
			Annual Cost (= Annual Cap \$ + O&M \$)	Annual Cost per Household	Annual Cost (= Annual Cap \$ + O&M \$)	Annual Cost per Household
Albert White	124,000	54,148	N/A	N/A	71,489	1.32
Belle Glade	30,000	13,100	1,456,114	111.15	N/A	N/A
Brentwood WWTP (Atlantic Utilities)	5,000	2,183	148,852	68.17	N/A	N/A
Broward Co. North Regional	800,000	349,345	N/A	N/A	203,209	0.58
Coral Springs	55,000	24,017	3,825,347	159.27	N/A	N/A
East Port (Charlotte)	50,000	21,834	3,419,742	156.62	N/A	N/A
East-Central Regional	550,000	240,175	58,080,893	241.83	N/A	N/A
Encon	180,000	78,603	12,845,890	163.43	N/A	N/A
Ft. Myers Beach	79,200	34,585	4,521,188	130.73	N/A	N/A
Ft. Pierce Utility Authority	90,000	39,301	6,594,851	167.80	N/A	N/A
G.T. Lohmeyer	430,000	187,773	46,023,847	245.10	N/A	N/A
Gasparilla Island	7,050	3,079	140,880	45.76	N/A	N/A
Manatee Co. SW	180,000	78,603	12,845,890	163.43	N/A	N/A
Margate	80,000	34,934	5,794,149	165.86	N/A	N/A
McKay Creek	60,000	26,201	4,205,288	160.50	N/A	N/A
MDW&S North District Regional	1,125,000	491,266	166,847,306	339.63	N/A	N/A
MDW&S South District	970,000	423,581	136,644,672	322.59	N/A	N/A
Melbourne - Grant St.	51,000	22,271	2,663,136	119.58	N/A	N/A
Miramar WWTP	89,000	38,865	6,543,293	168.36	N/A	N/A
North Ft. Myers	79,000	34,498	4,507,160	130.65	N/A	N/A
North Port (Charlotte)	15,000	6,550	705,446	107.70	N/A	N/A
North Port St. Lucie	15,000	6,550	705,446	107.70	N/A	N/A
Pahokee	12,000	5,240	238,444	45.50	N/A	N/A
Palm Bay (GDU-Port Malabar)	40,000	17,467	2,010,029	115.07	N/A	N/A
Palm Beach Southern Regional	300,000	131,004	25,366,376	193.63	N/A	N/A
Pembroke Pines (Century Village)	76,900	33,581	5,540,891	165.00	N/A	N/A
Plantation (Broward Co.)	300,000	131,004	25,366,376	193.63	N/A	N/A
Rockledge	45,000	19,651	2,974,063	151.35	N/A	N/A
Royal Palm Beach	63,400	27,686	4,338,437	156.70	N/A	N/A
Seacoast Utilities	120,000	52,402	9,106,089	173.77	N/A	N/A
South Beaches	90,000	39,301	N/A	N/A	38,559	0.98
South Collier County	10,000	4,367	N/A	N/A	38,559	8.83
South Cross Bayou	330,000	144,105	28,878,003	200.40	N/A	N/A
South Port St. Lucie	22,000	9,607	1,043,003	108.57	N/A	N/A
St. Petersburg NE	160,000	69,869	N/A	N/A	104,419	1.49
St. Petersburg NW	200,000	87,336	N/A	N/A	71,489	0.82
St. Petersburg SW	200,000	87,336	N/A	N/A	104,419	1.20
Stuart	40,000	17,467	2,729,876	156.29	N/A	N/A
Sunrise	80,000	34,934	734,147	21.01	N/A	N/A
Sykes Creek (Merritt Island)	60,000	26,201	N/A	N/A	71,489	2.73
West Melbourne	19,000	8,297	311,736	37.57	N/A	N/A
West Port (Charlotte)	3,300	1,441	62,749	43.54	N/A	N/A
Total			587,219,606		703,631	
<b>Grand Total (annual costs)</b>			<b>587,923,237</b>		0	

Notes: 1. These estimates reflect costs that might be incurred if facilities exhibit fluid movement and if advanced treatment is deemed necessary to protect the USDW.

2. Population data assume 100 gallons per person per day. These data reflect the population that is served by the discharge to the UIC well, not necessary the entire population served by the WWTP (because most facilities have multiple disposal practices).

3. Number of Persons / Household = 2.29, From the 1990 Census.